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# INTERNATIONALIZATION AS A DRIVER OF INNOVATION: THE CASE OF PUERTO RICO'S PHARMACEUTICAL INDUSTRY

Master´s Thesis in
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**ABBREVIATIONS**

| | |
|---|---|
| MNC | Multinational Corporation |
| KBV | Knowledge – based view |
| U – Model | Uppsala Internationalization Model |
| I – Models | Innovation – related internationalization models |

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**ABSTRACT**

The paper studies how internationalization is perceived to drive innovation within the MNC context. Much has been investigated about the connection between both concepts, yet a significant amount of literature has focused on the role of innovation as a driver of internationalization. After identifying this investigative pattern, the study seeks to broaden the current research scope by exploring the reverse relationship. The empirical study adopted a qualitative approach, where a multiple case study was conducted through semi – structured interviews.

From a theoretical standpoint, a comprehensive literature review has been conducted concerning the concepts of internationalization and innovation, both of which have been key elements in the expansion of current business practice and literature. The paper goes on to investigate what academia has found regarding how the former drives the latter. Further, from an empirical angle, the study makes a contribution to existing literature by conducting a detailed research about innovation and internationalization within Puerto Rico's pharmaceutical industry, focusing on internationalization – related factors that are perceived to influence its innovation. Finally, an analysis of the data is conducted and conclusions based on the studied empirical contributions are presented. Throughout the paper, several elements are identified as essential within the studied relationship, particularly knowledge, made evident throughout the theoretical and empirical findings.

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**KEYWORDS: internationalization, innovation, pharmaceutical industry, Puerto Rico, knowledge.**

# 1. INTRODUCTION

## 1.1. Background of the study

The development and evolution of the international economy has introduced important changes regarding the interaction amongst economic agents and the factors determining the conditions of competition (Fletcher 2001). This has resulted in an increase in the interconnectedness and interdependence of firms and in a greater participation of such firms in the global economy. Propelling these changes, internationalization and innovation have become two particularly growing themes (Rogers 2004).

Internationalization and innovation have transformed the business environment and have contributed to the creation and advancement of unique opportunities that many firms exploit in order to stay competitive. The current global changes in the economy require firms to broaden their focus past domestic markets and seek opportunities at an international level. As established by several authors, in today's challenging environment, businesses grow either by launching new products and/or services (innovation), by entering new markets and attracting new customers (internationalization), or by adopting a combination of both strategies (Kyläheiko et al. 2011; Denicolai et al. 2015).

Both internationalization and innovation have been key in the expansion of current international business literature, and researchers and scholars have made significant contributions regarding their roles. The breadth of perspectives vary, but a significant number of authors have extended the research spectrum and stipulated their pertinence in the continuous development and growth of companies. Some consider them as two of the most important factors determining business success (Buckler and Zien 1996; Wind and Mahajan 1997; Zahra and George 2002; Vila and Kuster 2007). Denicolai et al. (2015) establish that internationalization and innovation "play a vital role in today's competitive business environment and both are considered to be key drivers of firm performance."

Research has established that a cumulative causal relationship between internationalization and innovation exists (Filippetti et al. 2013), meaning that both factors influence each other. However, significant academic attention has been given to the role innovation plays as a driver of firm internationalization (Posner 1961; Hufbauer 1966; Vernon 1966; Amendola et al. 1993; Cantwell 1989; Cantwell and Sanna Randaccio 1993; Krugman 1995; Fageberger 1996; Murray and Ron 2010; Filippetti et al. 2013; Veglio and Zuchella 2015). This one – sided relationship has been thoroughly explored and discussed in literature, and significant insights have been proposed. As established by previous work, innovation drives internationalization because "product, process and managerial innovations can support international growth" (Veglio and Zuchella 2015). However, throughout the investigation, it was identified that not so much emphasis has been put on the reverse relationship: *how internationalization drives innovation*. Identifying this opportunity in research, the aim of this study is to explore and explain how internationalization drives innovation within the multinational corporation (MNC) context. Particularly, the study aims to contribute to existing literature by conducting an empirical research about how this relationship takes place within Puerto Rico's pharmaceutical industry.

## 1.2. Research questions and objectives

The aim of this study is to explore and explain how internationalization drives innovation. To conduct the empirical research, the paper will study how this takes place within Puerto Rico's pharmaceutical industry.

The research questions (RQs) are formulated in the following ways:

RQ 1: What do innovation and internationalization mean within Puerto Rico's pharmaceutical industry?

RQ 2: How is internationalization perceived to drive innovation within Puerto Rico's pharmaceutical industry?

The paper will take a deeper look into the existing theory explaining the relationship between internationalization and innovation, seeking to study how the former drives the latter in a broad, multinational context. In furtherance of applying the theoretical findings to a real international business setting, an empirical study will be conducted within Puerto Rico's pharmaceutical industry.

*Theoretical objective*:

TRO: Thoroughly explore the concepts of innovation and internationalization, taking a deeper look into the literature explaining the relationship between both concepts.

*Empirical objectives*:

ERO 1: Explore the concepts of innovation and internationalization within the context of Puerto Rico's pharmaceutical industry.

ERO 2: Explain the perceived ways in which internationalization drives innovation within Puerto Rico's pharmaceutical industry.

## 1.3. Scope and delimitations of the study

While the connection between internationalization and innovation is often considered causal (Filippetti et al. 2013), literature has focused primarily on exploring the influence of innovation on the internationalization of firms (Posner 1961; Hufbauer 1966; Vernon 1966; Amendola et al. 1993; Cantwell 1989; Cantwell and Sanna Randaccio 1993; Krugman 1995;

Fageberger 1996; Murray and Ron 2010; Filippetti et al. 2013; Veglio and Zuchella 2015). As established by Castaño et al. 2015, innovation makes products more competitive, either in terms of technology, price, or both. In this way, they state that through innovation, products are able to expand to more markets. However, while this innovation – internationalization relationship has been widely covered in literature, this paper aims to contribute to existing literature by going deeper into the other side of the relationship: *how internationalization drives innovation*. This research focus is based on the understanding that internationalization provides firms with favorable conditions, assets, and environments that allow them to successfully engage in and benefit from the opportunities that arise from innovation.

For the empirical part of the study, the paper aims to explore the concepts of innovation and internationalization within Puerto Rico's pharmaceutical industry, and explain how internationalization is perceived to drive innovation. Puerto Rico has a very strong pharmaceutical cluster. As reported by Healthcare and Life Sciences Review (2015), the country has an enormous industrial impact, as it comprises the fifth largest territory in the world for pharma manufacturing and has significantly increased its capabilities for research and development. As such, Puerto Rico's total manufacturing sector is dominated by the pharmaceutical sector, with 61% of its total manufacturing being pharmaceuticals. In 2013, the industry generated $43,800 million in exports (71% of total exports), and as of 2015 it represents 26.5% of the Island's gross domestic product. In that year, the industry also experienced market sales of $3.5 billion, representing a 10.5% growth compared to previous years (IMS Health 2015). Additionally, the pharmaceutical industry has made other significant contributions to the Puerto Rican economy, such as the generation of over 78,000 jobs (18,000 direct and 60,000 indirect), the development of an assets base of $10 billion, and an industrial environment that has contributed to the creation of local businesses that today have extensive international participation. (Pharmaceutical Industry Association 2015.)

From thorough investigation, the researcher of this study identified that the existing academic literature related to internationalization as a driver of innovation has not covered the pharmaceutical industry, and even less, this industry within Puerto Rico's context. As such, this represents an extraordinary opportunity to make a significant contribution to current research by shedding new light on the subject. The MNC was chosen as the firm of focus of this study, given its important role within the international economy. As established by Wattanasupachoke (2002), the global economic expansion has been largely facilitated by their growth, which currently lead world trade and capital movement. The author adds that the extent of their power has reached the point in which many of them have turnovers exceeding the gross national product of some countries. Thus, as these corporations continue to grow, they continue to influence the landscape of the world economy. Additionally, Miozzo and Soete (2001) establish that MNCs present appropriate conditions for the development of innovation, which is of extreme relevance for this research, as innovation is one of the main concepts under study. Moreover, the pharmaceutical industry is global by nature (ABPI 2016), with a sector value of $750 billion (Euler Hermes Economic Research 2016), thus presenting an inherent multinational inclination. Given that the empirical findings of this research focus on the phenomenon under study within a particular industrial and geographical context, these should not be generalized as applicable to every industry or company.

## 1.4. Structure of the study

The study is divided into nine chapters. Chapter 1 provides the background of the study, covering the scope of the research, the research questions and objectives, and the structure. Chapters 2 to 6 comprise the literature review of the research, and are aimed at achieving the theoretical objective of the study (TRO: *Thoroughly explore the concepts of innovation and internationalization, taking a deeper look into the literature explaining the relationship between both concepts*). As such, these chapters provide the overarching theoretical

foundation of the study's research questions. Chapter 2 explains the concept of innovation, presenting the types of innovation and main innovation strategies present in literature. Chapter 3 explains the concept of internationalization, further discussing the motives for internationalization, the process of entering foreign markets, and the types of foreign entry modes. The reason for providing comprehensive backgrounds of innovation and internationalization is to understand the underlying theoretical basis of the thesis and provide an exhaustive foundation that allows for a deep understanding of the two main concept under study. Further, Chapter 4 presents the knowledge – based view and how this is related to the capacity to innovate. Presenting the theory related to the knowledge – based view becomes important within this study because, as will be discussed further, knowledge has become an essential asset for firms engaging in international operations, playing a crucial role in how internationalization drives innovation. Chapter 5 presents the most relevant internationalization models and theories, given the empirical findings of this study. Furthermore, Chapter 6 links the previous concepts of innovation and internationalization, discussing the existing academic literature regarding their relationship. In the aim of exploring and explaining how internationalization drives innovation, the paper goes on to provide a review of the theoretical evolution present in literature. Within the theoretical evolution, certain elements that are believed to play important roles in how internationalization influences innovation will be discussed, such as knowledge, internal and external networks, and the influence of centralized and decentralized organizational structures. Moreover, Chapter 7 will explain the methodological structure of the paper, addressing the research purpose, design and strategy, as well as the data collection method and their respective justifications. Further, Chapter 8 will present the empirical findings gathered through the observed data, analyzing the information with the aim of exploring and explaining how internationalization is perceived to drive innovation within Puerto Rico's pharmaceutical industry. Finally, Chapter 9 concludes the research by presenting the main findings, managerial implications, limitations, and suggestions for further research.

## 2. INNOVATION

In order to explore and understand how internationalization drives innovation, it first becomes important to thoroughly discuss the main concepts under study. As such, the following chapter presents a comprehensive theoretical review of *innovation*. As one of the central elements of the paper, its discussion will provide a stronger theoretical foundation that will facilitate the understanding and answers to the research questions.

Innovation has become a relevant topic of research amongst scholars worldwide. It is currently regarded as a key ingredient for business success and considered one of the most important elements in business activity (Castaño et al. 2015). Most importantly, innovation is extensively acknowledged as being important to the ability of companies to compete both domestically and internationally (Ren et al. 2015). Hence, it becomes pertinent to study the concept more in depth.

Considering that innovation has been widely studied in business literature, there are naturally diverse explanations of the concept. Kanter (1984: 20) provides a comprehensive definition that includes several important components. The author defines innovation as "the generation, acceptance, and implementation of new ideas, processes, products, or services. It can thus occur in any part of a corporation and it can involve creative as well as original invention. It involves the capacity to change and adapt." This definition provides an exhaustive perspective of innovation, presenting the complete process, from its initial inception, to its compliance and final application. Additionally, the author presents an interesting statement regarding how innovation provides a degree of novelty that, consequently, brings *change*. This change, however, has a level of desirability and intentionality (West and Farr 1990). Another explanation of innovation is provided by the Oslo Manual (2005: 46), which defines it as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations."

Additionally, Baregheh et al. (2009) define it as the "multistage process whereby organizations transform ideas into new/improved products/services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace." From the definitions aforementioned, it can be derived that, although diverse explanations of innovation exist, they all present several common denominators, namely *novelty* and *uniqueness*. As established by Buse et al. (2010), this novelty does not necessarily involve new knowledge per se, but can also concern the advancement of existing knowledge. As such, novelty and uniqueness in innovation can be acquired either in their entirety or through incremental and continuous improvements. As stated by the authors, innovation is the result of a dynamic process that involves the exchange of diverse *internal* and *external* factors. Kyläheiko et al. (2011) support this view and add that within international business, innovation is "related to the firm's ability to utilize its existing knowledge base and to acquire knowledge from external sources by means of imitation, licensing, partnerships or acquisitions." These perspectives emphasize the importance of both internal and external knowledge in the process of innovation, which becomes essential when studying how internationalization drives innovation, as will be discussed in subsequent sections.

## 2.1. Types of innovation

Innovation can take diverse forms. However, it has been classified into four main groups: *product*, *process*, *paradigm*, and *position* (Francis and Bessant 2005; Bessant and Tidd 2007:13). *Product innovation* relates to changes and improvements in the goods or services that organizations offer; *process innovation* relates to new or improved methods in which these goods or services are produced and delivered; *paradigm innovation*, also referred to as "*organizational innovation*," regards new organizational methods implemented by firms which frame what they do in terms of business practices, workplace organization, or external resources; and finally, *position innovation*, also referred to as "*marketing innovation*," relates to the changes in the contexts in which the products or services are introduced, such

as new or improved product designs, packaging, placements, distribution, promotion, and pricing (Baregheh et al. 2012; Dabić et al. 2012).

From the discussion, innovation is broad (Filippetti et al. 2013) and may be implemented to different parts of business, depending on firms' needs and objectives. In general, Filippetti et al. (2013) establish that innovation can be categorized into two major groups: *technological* or *organizational* innovation. They state that they are both dependent on certain factors, such as type of input, macro and micro environments, government policies, and the degree of internationalization of firms. However, they are interconnected and complementary and can have a significant impact on performance. While there are diverse classifications, research suggests that innovation types are interdependent, as the implementation and adoption of one type of innovation may require or lead to the implementation or adoption of another type (Wischnevsky et al. 2011). The Oslo Manual (2005:18) establishes that the minimum requirement for an innovation is that it, whether related to the product, process, organization, or marketing, must be new or significantly improved to the firm.

## 2.2. Innovation strategies

When selecting an innovation strategy, companies have to select the type(s) of innovation that will allow them to create and capture the most value, and identify what resources each type should receive (Pisano 2015). The author establishes that technological innovation has historically been an essential creator of economic value and a pivotal driver of competitive advantage. However, he argues that not all innovations are related to technology, and that business model innovation has become very relevant in recent years. In this sense, when thinking about economic opportunities, companies should decide how to go about the two dimensions: how much of their innovative efforts to include towards technological innovation and how much to invest in business model innovation. To address this issue, the

author developed an innovation matrix, known as "The Innovation Landscape," which evaluates how a potential innovation integrates with a company's existing technical capabilities and business model. (Pisano 2015.) **Figure 1**. presents the matrix and, following, the paper takes a deeper look at each category.

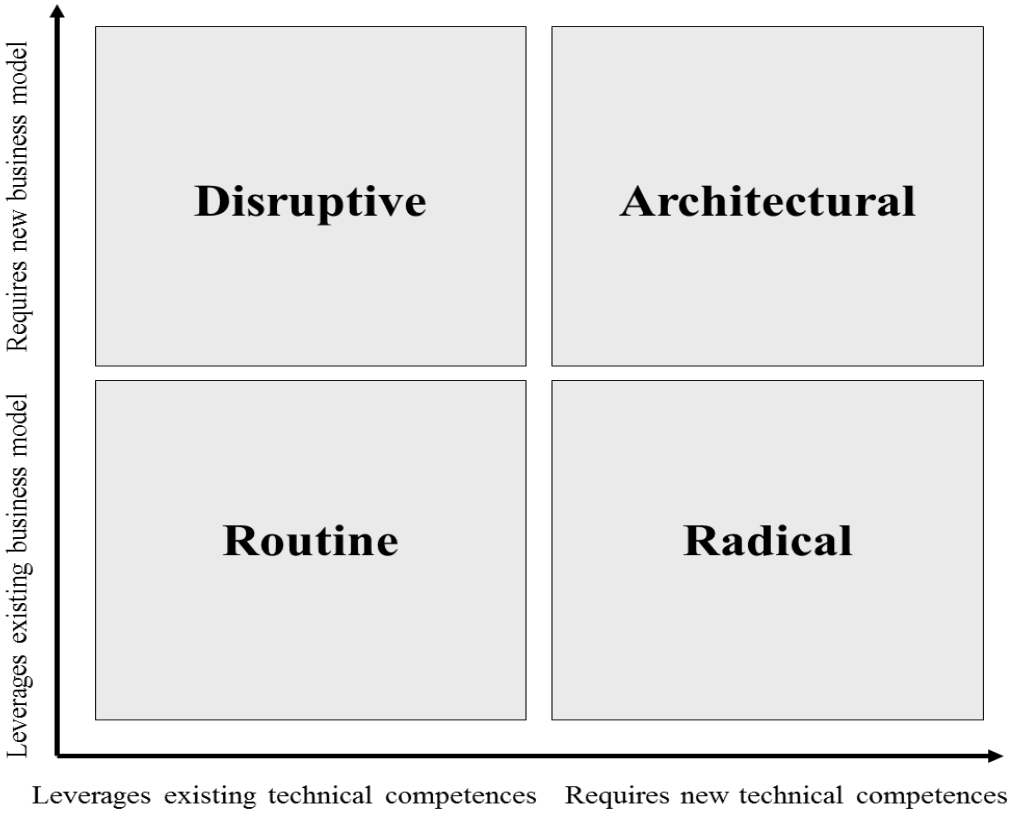


**Figure 1**. The Innovation Landscape Matrix (Pisano 2015).

As there are significant differences in the nature of the innovation implementation of firms (Orlikowski 1991), there has been considerable discussion concerning its categorization (Baregheh et al. 2012). According to Baregheh et al. (2012), the two main approaches discussed in research regard the classification of innovation in terms its nature and degree.

Based on this, research has mainly classified innovation as *radical* or *incremental* (Dewar and Dutton 1986; Orlikowski 1991; Bessant and Tidd 2007: 14). According to O'Sullivan (2008: 23) *radical innovation*, also referred to as "*breakthrough"* innovation, relates to making major changes in something existent. Pisano (2015) argues that the challenge with this category is essentially technological. Dewar and Dutton (1986) add that it is related to paradigmatic changes, representing significant differences from prevalent practice or knowledge. As such, this type of innovation changes the existing innovative paradigms within firms and industries. While implementing radical innovation can be highly beneficial for firms in terms of increased sales and profits, it is also highly resource – intensive and risky (O'Sullivan 2008: 23). The author establishes that this is especially true within the pharmaceutical industry, in which companies invest millions of dollars in developing new drugs and yet have no guarantee that they will ever pass regulatory and clinical trials and make it to the market. On the other hand, *incremental innovation*, also referred to as "*sustaining"* or *"routine"* innovation, also represents accumulative changes in products or processes, but through minor improvements or adjustments that fit with the company's existing business model (Dewar and Dutton 1986; Pisano 2015). Many firms undertake innovation under this approach, implementing small, incremental innovations to their products, processes, and services (O'Sullivan 2008: 24). However, if firms successfully implement enough incremental innovations, these can sometimes lead to similar levels of growth as those achieved by radical innovations (Dewar and Dutton 1986). In fact, Pisano (2015) highlights the role of routine innovation by establishing that a vast majority of profits are achieved through it. The main drivers of incremental innovation include approaches to continuous improvement such as lean manufacturing, total quality management, and world – class manufacturing (O'Sullivan 2008: 24), as is often the case of the pharmaceutical industry. *Disruptive innovation* is an additional type of innovation that has also been widely studied (Reinhardt and Gurtner 2015). Also referred to as "*transformational"* innovation, it could be considered the most groundbreaking type of innovation from the three types previously discussed, as disruptive innovations often change the way markets behave and the subsequent innovations that are developed. In other words, they change the "rules of the game." The theory of disruptive innovation goes back to the work of Abernathy and Clark

(1985), who relate such innovation to technical innovation by suggesting that disruptive innovations often destroyed the value of prevalent technical capabilities (Christensen and Bower 1996). However, the concept eventually broadened and now includes not only technologies but also products and business models that allow firms to deliver superior value to customers (Christensen 2006; Markides 2012; Pisano 2015). Lastly, *architectural innovation* is what Pisano (2015) refers to as a combination of technological and business model disruptions, stating that it is the most challenging innovation category to pursue. It is important to note, however, that while there are evident differences between the aforementioned innovations strategies, the author argues that there is not one preferred type. In fact, over time, different kinds of innovation can become complements, rather than substitutes. (Pisano 2015.)

## 3. INTERNATIONALIZATION

After discussing the concept of *innovation*, this chapter presents a comprehensive review regarding *internationalization*, given that it is the other central element of the paper. Its explanation and discussion will also provide a stronger theoretical foundation that will facilitate the understanding and answers to the research questions.

Internationalization has become a widely studied phenomenon over the last decades and, according to Zhang (2008), it has developed as the main feature of the current world economy. It is not a new concept, but has recently become an important business strategy (Sdiri and Ayadi 2014), because as many companies develop and grow, their need to expand to foreign markets has become essential. Management literature has established that internationalization has become a standard requirement for successful business (Kumar et al. 2013), as it represents a significant opportunity for growth and value creation in organizations (Buckley and Casson 1976; Lu and Beamish 2001; Kyläheiko et al. 2011). In support, Buckley and Ghauri (1993) establish that the growth of the firm provides a foundation to internationalization and, to some degree, the concepts of internationalization and growth are intertwined. Internationalization has also introduced new and complex challenges, and firms engaging in foreign markets are constantly faced with issues regarding international decision – making and management, the development of international activities, and factors favoring or disfavoring internationalization (Ruzzier et al. 2006).

As defined by Hitt et al. (1994), internationalization relates to "expanding (activities) across country borders into geographical locations that are new to the firms." Another definition provided by Ruzzier et al. (2006) presents internationalization as "the geographical expansion of economic activities over a national country's border," adding that it is also considered "a changing state." As will be discussed further, there are diverse reasons for firms to internationalize.

## 3.1. Motives for internationalization

The increasingly global business environment has led to significantly higher international integration and interdependence (Wattanasupachoke 2002). Firms are now presented with unique opportunities that allow them to expand their participation and geographical reach. This process has been facilitated by important advances in technology, state of the art infrastructure (international communication and transportation), falling trade barriers, deregulation and homogenization of global markets, and saturation of local demand (Yip 1989; Oviatt and McDougall 1994; Ripollés and Blesa 2012; Kumar et al. 2013). These advances have simplified and shortened the process of firm internationalization (Oviatt and McDougall 1994). They have also created favorable institutional and economic conditions that represent extraordinary growth opportunities for firms, making internationalization a vital strategy to expand their operations rapidly and exploit new business opportunities at a global scale (Ren et al. 2015). This progress has greatly increased global competition, making internationalization a necessity for growth, and not merely an option. As stated by Wattanasupachoke (2002), internationalization "has become one of the key strategic decisions for firms to maximize or at least sustain profits to survive in the world of uncertainty and complexity."

Firms decide to internationalize their economic activities for an array of reasons, and while their motivations are often mixed and numerous, internationalization is often associated with firms' pursue of market gain, profitability, and growth. While some firms go abroad to expand their products by exporting or establishing subsidiaries, many firms go abroad to have access to know – how and technologies in order to stay competitive. These reasons vary depending on their needs and objectives, as well as on the opportunities of the foreign market (Albaum et al. 1998). As such, firms have diverse motivations and, thus, adopt different internationalization approaches.

Yip (1989) establishes that there are four main drivers that impulse firm internationalization. These are: (1) market drivers, (2) cost drivers, (3) government drivers and (4) competitive drivers. *Market drivers* are based on homogeneous customer needs, global customers, global channels, and transferable marketing, all of which allow for uniform international marketing strategies. *Cost drivers* refer to economies of scale and scope, learning and experience, sourcing efficiencies, favorable logistics, differences in country costs and skills, and reduced global development costs. *Government drivers*, on the other hand, refer to favorable trade barriers, compatible technical standards, and common marketing regulations. Finally, *competitive drivers* refer to the increasing interdependence of countries as globalized competitors. (Yip 1989.) Wattanasupachoke (2002) establishes that the internationalization process of firms may be driven by external or internal triggers. However, as the author explains, internationalization often results from a combination of both. The internal triggers influencing internationalization relate to the changes that occur within firms, representing their constitutional strengths and weaknesses. These include the vision of executives and the risk aversion of the decision makers. The *external triggers* of internationalization, on the other hand, are the factors outside the control of firms, representing their opportunities and threats. (Wattanasupachoke 2002.) These internal and external triggers are determinant in the choice of entry modes made by firms (Ravelomanana et al. 2015).

## 3.2. Entering foreign markets

Root (1994: 324) establishes that choosing an entry strategy for international markets requires a comprehensive plan in which the firm sets forth the objectives, goals, resources, and policies that will guide its international business operations over a future period. As such, determining the appropriate entry mode is a complex process that requires much analysis and in – depth considerations of a variety of factors. Luo (2002: 181) establishes that entry strategies concern *where* (location), *when* (timing), and *how* (entry mode) MNCs should enter and invest in a foreign country during their international expansion. According

to the author, these strategies are important because they influence the internationalization process, mainly the "investment environment, operation treatment, resource commitment, and evolutionary path."

The selection of the *location* (where) regards the country and specific region in which a company's foreign project is to be located. This process is influenced by certain considerations, such as: cost and tax factors, demand factors, strategic factors, regulatory and economic factors, and sociopolitical factors. *Cost and tax factors* relate to transportation and construction costs, wage rates, availability and costs of land, costs of raw materials and resources, financing costs, tax rates, investment incentives, and profit repatriation. On the other hand, the *demand factors* regard market size and growth, potential customers, and local competition. The *strategic factors* relate to the investment of the infrastructure, the strength of the existing manufacturing activities, the industrial connections, the workforce productivity, and the inbound and outbound logistics. Furthermore, the *regulatory and economic factors* consist of industrial policies, FDI policies, and existence of special economic zones. Finally, the *sociopolitical factors* involve political stability, cultural barriers, local business practices, government efficiency and corruption, attitude towards foreign business, market characteristics, and pollution control. (Luo 2002: 181- 190). On the other hand, the selection of the *timing* (when) is related to the period frame in which the company enters the foreign market(s). This is very important because being an early or late mover determines the risks, environments, and opportunities these firms may encounter. Being a pioneer in the market has several advantages, particularly related to acquiring market power. For example, early movers have better chances of investing in facilities, distribution networks, product positioning, patentable technology, natural resources, and human and organizational know-how. Additionally, they are presented with unique opportunities to form exclusive and deeper relationships with their markets, which could potentially lead to customer loyalty. Moreover, market pioneers gain from many preemptive opportunities. For example, early movers have the right to acquire marketing, promotion, and distribution channels, while increasing their product image, reputation, and brand recognition. Additionally, early movers are presented with more strategic options in selecting industries,

locations, and market orientations. They are also given priority access to resources, materials, distribution channels, promotional arrangements, and infrastructure. However, being an early mover also comes with its downside. For example, they confront greater degrees of environmental uncertainty and operational risks. This is not the case for late movers, who enter markets when they are already stable, regulatory conditions are more favorable, and infrastructure is already available. Market pioneer disadvantages also relate to the high costs they have to pay in order to settle and learn in the foreign markets. (Luo 2002: 192- 195.) However, even though location and timing are critical to successful market entry, in today's increasingly globalized market, entry modes (*how*) have gained particular attention and importance (Baena and Cerviño 2015).

While firms are presented with a variety of options for entering foreign markets, they need to identify and thoroughly analyze the strengths and weaknesses of each entry mode. The choice of such modes is critical, as they determine the "degree of foreign involvement in host economies, level of foreign control of local operations, and their level of impact in the local economy" (Contractor and Kundu 1998). Therefore, it is evident that the selection of foreign entry modes is determinant on the level of ease or difficulty of market entry, as well as the survival of firms in such markets.

### 3.3. Types of foreign market entry modes

A foreign market entry mode is "an institutional arrangement that makes possible the entry of a company's products, technology, human skills, management or other resources into a foreign country" (Root 1987: 5). In other words, they are corporate agreements for coordinating and conducting international business transactions (De Villa et al. 2015). Their selection is not easy (Brassington and Pettitt 2000: 1079), as there are many relevant factors that firms need to take into consideration according to their needs and objectives in the host markets (Ravelomanana et al. 2015). As established by the authors, some of the criteria firms

need to consider are: level of investment (indirect or direct), production of goods or services (home or abroad), relationship between exporter and buyer (direct or indirect), and width of transaction (if it involves exporting goods and services, knowledge and expertise or investment). Research shows that entry modes also influence the flow of information between the firm and the foreign market (Johanson and Wiedersheim – Paul 1975; Johanson and Vahlne 1977). As such, they facilitate or impede firms' access to the foreign market knowledge resources that they need in order to adapt and overcome differences in language, business practices, culture, political systems, industrial development, or geographic distance (Johanson and Vahlne 1977; Dow 2000; Mogos – Descotes and Walliser 2010).

The entry approaches adopted by firms may vary depending on different factors, such as firm type, size, industry, international objectives, and available resources. While some firms may prefer to internationalize their production, other may decide to internationalize their whole business (Kafouros et al. 2008). Malhotra and Hinings (2010) establish that different businesses have different needs, and thus require distinct approaches to internationalization. As stated by the authors, "each organization type responds differently to critical elements of the internationalization process, namely, the focus of entry, the degree of presence, and physical presence requirements in the foreign market." The responses to these factors influence what modal forms are appropriate.

As previously mentioned, the ways in which firms internationalize operations and economic activities can take diverse forms. Wattanasupachoke (2002) states that the level of involvement of firms in international business can be categorized in different types of foreign entry modes, ranging from *import* and *export* entry modes, *contractual* entry modes, and *investment* entry modes. While imports and exports are the conventional forms of international activities of firms, firms can choose from a variety of other modes: licensing, franchising, contracting, sales subsidiaries, manufacturing subsidiaries, wholly owned subsidiaries, joint ventures, acquisitions, strategic alliances, management contracts, turnkey contracts, subcontracting or associations, and consortiums, etc. (Brassington and Pettitt 2000; Malhotra 2003; Wild et al. 2003; Armstrong and Kotler 2005: 581). International

licensing and franchising are examples of *contractual* entry modes, while *investment* entry modes encompass joint ventures, consisting of contractual operations, equity joint ventures and strategic alliances, and sole ventures or wholly owned subsidiaries (Wattanasupachoke 2002).

Interestingly, knowledge has become a relevant subject within the selection of market entry modes, as MNCs are increasingly dealing with the transfer of knowledge assets throughout their international divisions (Malhotra 2003). Consequently, a main concern has been the protection of knowledge from threats of opportunism. According to Malhotra (2003), these threats are undermined with the development of different types of knowledge within the firm, making them sources of competitive advantage. The author establishes that knowledge held at the individual, team, and organizational levels combine to generate a source of advantage for the firm. These types of diversified knowledge include: individually – held or team – held knowledge, such as technical and/or experiential knowledge; knowledge of personal relationships and connections; and knowledge of the host country/ies, also known as "market knowledge." (Maholtra 2003.) Additionally, some entry modes are believed to foster knowledge within the MNC context. For example, according to Grant and Baden – Fuller (2004), strategic alliances increase knowledge specialization and cause broadening of the firm's knowledge base. The authors establish that strategic alliances embrace a diversity of collaborative forms. These cover: supplier-buyer partnerships, outsourcing agreements, technical collaboration, joint research projects, shared new product development, shared manufacturing arrangements, common distribution agreements, cross-selling arrangements, and franchising.

## 4. KNOWLEDGE – BASED VIEW OF THE FIRM

While much attention has been placed on the traditional *resource – based view* of the firm, recent studies have developed another approach to this theory: the *knowledge – based view* of the firm (KBV). As one of the main motivators of global innovation, access to knowledge has become particularly relevant (Buse et al. 2010). It has been argued that to perform well, firms cannot rely solely on conventional resources and capabilities, but also require the "tacit collective knowledge embedded in the firm's routines to integrate, coordinate, and mobilize those resources and capabilities successfully" (Grant 1996). Other authors confirm that firms' unique knowledge, as well as the ability to create and transfer it across their divisions, are considered a strategic asset that may be positively associated with higher levels of performance, as they are difficult to trade and imitate, and are scarce, appropriable, and specialized (Nonaka and Takeuchi 1995; Bierly and Chakrabarti 1996; Spender 1996; Teece 1998). Business literature also affirms that knowledge – based resources and the creation of knowledge through learning are fundamental mechanisms that lead towards "competitive advantages and business success" (Mogos – Descotes and Walliser 2010). In the same way, companies who seek to actively identify, develop, and implement their unique knowledge resources are presented with an exclusive set of assets that can increase their innovative performance.

Given these findings, it can be drawn that knowledge plays an essential role in the development of the innovative competitive advantages of firms, particularly those with international participation, as a rise in global presence leads to increased external knowledge sources. As established by Chiva et al. (2013), "organizational learning, innovation and internationalization are key ingredients for the knowledge-based economy in the age of globalization." Cohen and Levinthal (1990) argue that external sources of knowledge are critical to the innovation process.

Networks have had an increasingly important role in the knowledge development of firms. In this way, collaborative relationships are now considered an extremely important form of organization of innovative activities. This is particularly true within the pharmaceutical industry, where the role of scientific knowledge in research is emphasized and the nature of the learning processes foster the development of networks. (Orsenigo et al. 1998.)

It has been widely proposed that innovation has a positive impact on corporate performance. In this way, increasing investments in innovation essentially allows firms to develop and license new technologies, adopt more efficient production techniques, introduce new products and processes, and consequently become more competitive and increase their economic performance (Kafouros et al. 2008). However, several scholars have argued that not all firms benefit from their innovative efforts (Link 1981), presenting several limitations to the knowledge – based view regarding innovation. Shearmur et al. (2015) establish that even though firms can open themselves to external markets, they may not be able to appropriate all the information and knowledge to which they have access, as they may not always recognize their potential value or have the capacity to incorporate them to their existing knowledge base. As the author explains, this is explained by the tacit characteristics of knowledge. Research has established the difficulties of transferring tacit and complex knowledge within organizations (Zander and Kogut 1995; Szulanksi 1996).

A predominant theoretical explanation as to why some firms are more likely to benefit from external knowledge than others involves the concept of *absorptive capacity*, introduced by Cohen and Levinthal (1990). The authors define absorptive capacity as "as the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends", identifying it as "critical to its innovative capabilities." They add that to the degree that absorptive capacity is important to firms, investment in research and development, as in the case of the pharmaceutical industry, for example, can lead to increased absorptive capacity and, thus, to higher performance. According to Shearmur et al. (2015), this becomes especially important because such absorptive capacity "contributes directly to innovation by allowing for the identification and translation of external

knowledge inflows into tangible benefits for the firm." As such, developing a strong absorptive capacity is essential. Additionally, O'Cass and Sok (2012) define *innovation capabilities* as the "bundle of interrelated processes a firm has in place to facilitate and implement successful development, evolution, and execution of product innovation." Sok et al. (2013) establish that having superior innovation capabilities is key for increased firm performance. Several studies have determined that this capacity to innovate allows firms to stay competitive, as it assists them in developing superior products to meet their customers' changing needs and demands (Verhees and Meulenberg 2004; Li and Mitchell 2009; Rosenbusch et al. 2011). This is pivotal in order to succeed in the marketplace (Sok et al. 2013), which becomes crucial for firms with international participation.

# 5. INTERNATIONALIZATION PROCESS THEORIES AND MODELS

As this study aims study how internationalization drives innovation, it becomes important to present diverse internationalization models adopted by firms, in order to further analyze throughout the research how they influence innovation. The increasing understanding of the ever – changing nature of MNCs has led to two broad classifications that can help determine the focus of their internationalization approach. These are *economic theories* and *behavioral theories*. While traditional research regarding MNC internationalization have focused on economic theories, this study explores various internationalization models that stem from the behavioral theories, which represent the general internationalization approach within the sample of this study.

Within the MNC context, there are diverse approaches to internationalization. As will be further discussed, some consist of gradual, incremental steps towards international expansion, while others are based on collaborative relationships and networks. The appropriateness of the internationalization model(s) selected by MNCs depend on the industrial context to which they are applied (Andersson 2004). According to the author, the usefulness of these models depend on firms' degree of internationalization and whether their industries are mature or growing. Acknowledging this, not all theories apply to every MNC case. However, they can complement each other. The chapter presents several important internationalization models adopted by firms: the Stages Models (Uppsala Internationalization Model and Innovation – related Models) and the Network Theory.

## 5.1. Stages Models

Murray and Ron (2010) establish that innovation has been linked to internationalization through the stages models approach, where internationalization is seen as a cautious and

progressive process. The stages approach to internationalization suggests that companies initially serve their home markets and then gradually increase their international involvement, most often as a result of incremental learning (Baronchelli and Cassia 2008). The stages models discussed in the paper are: the Uppsala Internationalization Model and Innovation – related Models. These are discussed because they represent the overall internationalization behavior of the studied sample.

### 5.1.1. The Uppsala Internationalization Model

The Uppsala Internationalization Model (U – Model) (Johanson and Wiedersheim – Paul 1975) is arguably one of the most studied approaches to internationalization and particularly relevant for this study as it represents the internationalization approach adopted by several of the interviewed companies. The U – Model views the internationalization process of firms as the product of a series of incremental decisions, where companies initially develop in their domestic markets, and where internationalization is the consequence of a series of gradual, cumulative decisions. In this model, internationalization is seen as a process companies develop as changes and advances occur within them and their environment (new problems and opportunities). In other words, firms move on their internationalization path following logical steps that are based on their gradual gain and use of information acquired through foreign markets and operations. The outcome of one decision is the input of another, making decisions interdependent of each other.

The U – Model arose from the understanding that many firms internationalize their operations while still relatively small, gradually developing their activities abroad, contrary to substantial initial foreign investments. As established by Carneiro et al. (2008), the Model states that firms will first seek to internationalize to psychically close countries (markets with short *psychic distance*) and gradually move to more distant markets. This is due to difficulties of understanding foreign environments, primarily related to differences in language, education, culture, business practices, political systems, and level of industrial development (Johanson and Wiedersheim – Paul 1975).

The U – Model distinguishes four stages of internationalization, each representing a higher degree of international involvement. These are: no regular export activities, exports done through independent representatives (agents), sales subsidiaries, and production and manufacturing (Johanson and Wiedersheim – Paul 1975). The authors describe these stages as an *establishment chain*, and they represent the expansion patterns. Further, as established by Forsgren (2002), there are three basic assumptions encompassing the U – Model. The first assumption states that the *lack of knowledge* about foreign markets is considered a major obstacle to international expansion. However, such knowledge can be acquired. The author states that acquiring knowledge highly depends on being active in the new environment rather than on just collecting and analyzing information. By being active within the market, firms not only acquire information about that market, but also become so closely connected to the market that it becomes "difficult to use its resources for other purposes." As Johanson and Vahlne (1990) state, the main source of knowledge is the firm's own operations. From this first assumption, it is drawn that an active participation of firms in their foreign markets is their main source of learning.

The second assumption is that *market uncertainty* is one of the principal reasons why firms invest in foreign markets incrementally and not substantially in the beginning. The more firms know about their markets, the lower the perceived market risk will be, leading to higher levels of foreign investment in that market throughout time (Forsgren 2002). This second assumption regards the decrease of risk and, thus, increase of investment, once sufficient market information is gathered. The third and final assumption states that *knowledge highly depends on individuals* and is, thus, difficult to transfer to other individuals and contexts. This last assumption relates to the complication of transmitting experience, mainly because experience "produces a change [...] in individuals and cannot be separated from them" (Johanson and Vahlne 1977). This presents a challenge, as the problems and opportunities innate to a specific market will most likely be identified and solved by the people who are working in such market (Forsgren 2002). However, as stated by Johanson and Vahlne (1990), experience can work as a driving force in the internationalization process of firms.

Under the U – Model approach, there is a distinction between *state* and *change* aspects of internationalization. *State* aspects are the commitment to the foreign market (market commitment) and the knowledge about the foreign markets and operations (market knowledge). *Market commitment* can be analyzed through amount of resources that have been committed (amount of investment in the market) and the degree of commitment (difficulty of identifying an alternative use for the resources and transferring them to such alternative use). *Market knowledge* within the U – Model, on the other hand, gains relevant attention. As established by Andersen (1993), internationalization requires both general and market – specific knowledge. According to Johanson and Vahlne (1977), general knowledge relates to marketing methods and common characteristics of certain types of customers, regardless of their geographical location. As such, this kind of knowledge can often be transferred between countries. However, market – specific knowledge regards methods that vary according to markets. As such, firms need to adapt their approaches to the diverse geographical contexts. This market – specific knowledge is gained mainly through experience, though there are also other possibilities to develop it. Additionally, the U – Model establishes a difference between objective and the experiential knowledge. While the objective knowledge can be taught by firms, the experiential knowledge, as previously explained, can be only acquired through personal experience. This latter type of knowledge gains particular importance as it is believed that experiential knowledge provides managers and employees with the pertinent background to perceive and formulate real opportunities, while objective knowledge regards mainly theoretical opportunities. Thus, experiential knowledge plays a key role in the internationalization of firms. Furthermore, the *change* aspects of the U – Model relate to the decisions to commit resources (commitment decisions) and the performance of the current business activities (current activities). **Figure 2**. summarizes the basic mechanisms to internationalization according to the U – Model. (Johanson and Vahlne 1977).

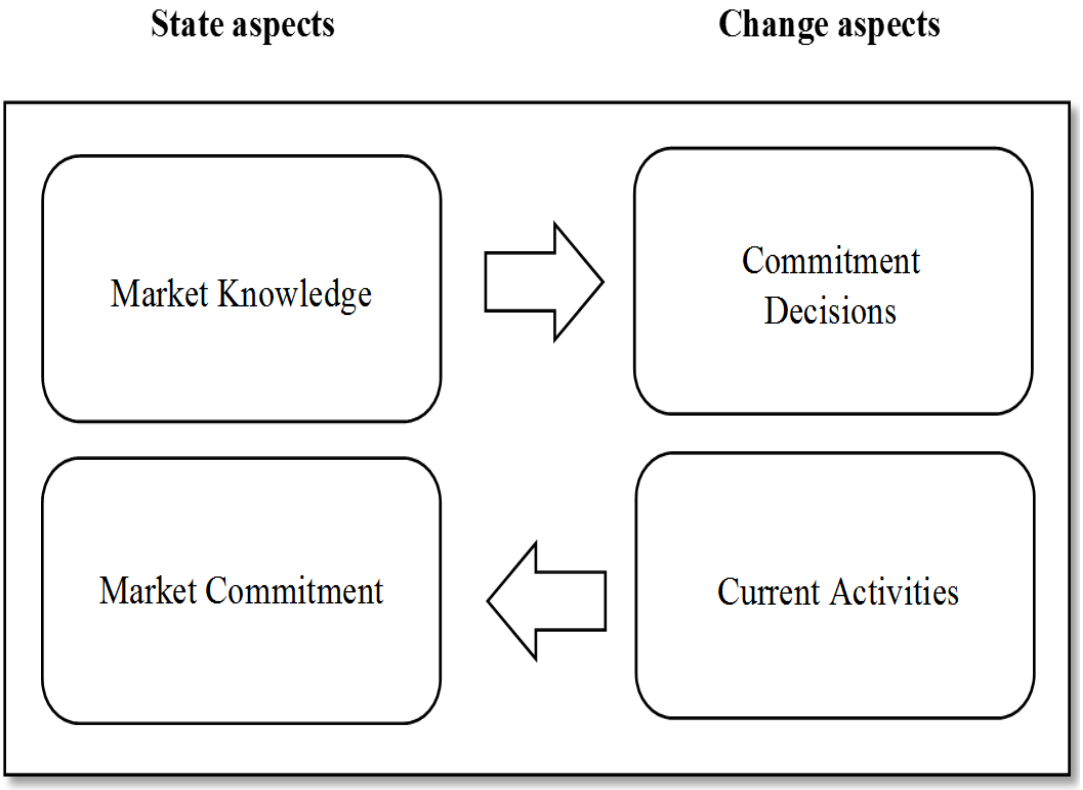


**Figure 2**. Internationalization through the Uppsala Internationalization Model (Johanson and Vahlne 1977).

The Model, however, presents some limitations, as it does not explain what produces the first internationalization step. It also does not explain the behavior of already established MNCs that have extensive international experience. In addition, the U – Model does not explain why some firms do not follow the logical sequence suggested by the model and why some firms are born – globals. Born global companies are those that conduct international business at or near their founding (Knight and Liesch 2016). In other words, they are early adopters of internationalization. As Oviatt and McDougall (1994) put it, they have an "international vision [...] from inception."

Recently, the U – Model was updated and several additional elements were included. According to Johanson and Vahlne (2009), environmental business changes and the development of the *network theory*, which will be discussed further in the chapter, called for changes in the model. *Trust* became an important factor in successful learning and development, as well as in relationships, commitments, and decisions. The updated U – Model is based on the assumptions that existing business relationships have a considerable impact on the particular market a firm will decide to enter and on which specific mode to use. In addition, internationalization is now seen as being more dependent on developing opportunities than on overcoming uncertainties, as the recognition of opportunities was added to the knowledge concept.

### 5.1.2. Innovation – related Internationalization Models

The internationalization process of firms can also be studied from an innovation – related perspective, for which there are diverse models. These innovation – related internationalization models (I – Models) show the stages of the internationalization adoption process. In I – Models, each stage of internationalization is seen as an innovation for the firm (Andersen 1993; Gankema et al. 2000). **Table 1.** presents Andersen's (1993) review of the most important I – models, summarizing their diverse stages to internationalization.

**Table 1.** A review of innovation – related internationalization models (Andersen 1993).

| **Bilkey and Tesar (1977)** | **Cavusgil (1980)** | **Czinkota (1982)** | **Reid (1981)** |
|---|---|---|---|
| **Stage 1** Management is not interested in exporting | **Stage 1** Domestic marketing: The firm sells only to the home market | **Stage 1** The completely uninterested firm | **Stage 1** Export awareness: Problem of opportunity |

| | | | |
|---|---|---|---|
| **Stage 2**<br>Management is willing to fill unsolicited orders, but makes no effort to explore the feasibility of active exporting<br><br>**Stage 3**<br>Management actively explores the feasibility of active exporting<br><br>**Stage 4**<br>The firm exports on an experimental basis to some psychologically close country<br><br>**Stage 5**<br>The firm is an experienced exporter<br><br>**Stage 6**<br>Management explores the feasibility of exporting to other more psychologically distant countries | **Stage 2**<br>Pre-export stage: The firm searches for information and evaluates the feasibility of undertaking exporting<br><br>**Stage 3**<br>Experimental involvement: The firm starts exporting on a limited basis to some psychologically close country<br><br>**Stage 4**<br>Active involvement: Exporting to more new countries--direct exporting--increase in sales volume<br><br>**Stage 5**<br>Committed involvement: Management constantly makes choices in allocating limited resources between domestic and foreign markets | **Stage 2**<br>The partially interested firm<br><br>**Stage 3**<br>The exploring firm<br><br>**Stage 4**<br>The experimental firm<br><br>**Stage 5**<br>The experienced small exporter<br><br>**Stage 6**<br>The experienced large exporter | recognition, arousal of need<br><br>**Stage 2**<br>Export intention: Motivation, attitude, beliefs, and expectancy about export<br><br>**Stage 3**<br>Export trial: Personal experience from limited exporting<br><br>**Stage 4**<br>Export evaluation: Results from engaging in exporting<br><br>**Stage 5**<br>Export acceptance: Adoption of exporting/rejection of exporting |

The I – models presented are argued to be very similar, sharing characteristics in terms of their sequential stages, although the number of stages differ (Andersen 1993). In the models developed by Bilkey and Tesar (1977) and Czinkota (1982), firms present no initial interest in foreign participation. However, this attitude towards internationalization gradually changes as they get involved in operations overseas, particularly through exporting. This is believed to be due to "push" factors or external changes that initiate the export decisions (Andersen 1993). On the other hand, Cavusgil (1980) and Reid (1981) developed models in which firms are more interested in international participation form earlier stages. This is particularly evident in the model developed by (Reid 1981), which presents an interest in foreign operations from the first stage, with a distinct export intention and motivation. As such, "pull" factors or internal changes are believed to be what drive firms to the next internationalization stages (Andersen 1993).

The U – model and I – models discussed are often used to analyze large firms with the aim of explaining their development of internationalization and international activities (Ruzzier et al. 2006). It is important to note that their gradual behaviors are explained by two main reasons: lack of knowledge of the firm, particularly experiential knowledge; and uncertainty regarding the decision to internationalize (Andersen 1993).

## 5.2. Network Theory

As discussed previously, *networks* became an important element in the updated version of the U – Model (Johanson and Vahlne 2009). The theory was chosen in this study because throughout the empirical research, it became evident that networks in foreign markets play important roles in the internationalization of firms within the studies industry, given its global nature and interconnectedness. The network theory views industrial markets as networks of relationships between firms. Madsen and Servais (1997) establish that in the process of internationalization, the first step a firm must follow is understanding the market

where it operates, its environmental conditions, and the firm's relationships. It is through these relationships that firms gain access to external resources that allow them to establish themselves successfully in foreign markets. Current literature on innovative firms has focused on the important correlation between the management style, the innovation activity, and the network relationships of the firm (Lipparini and Sobrero 1994).

Nowadays, it can be argued that the degree of internationalization of firms highly depends on the number of networks they have and the strengths of such relationships. Johanson and Mattsson (1988) establish that as firms increase their international involvement, the number and strength of the relationships established within their networks consequently increase, helping all the more their international expansion. According to the authors, networks are stable and also changing, and the exchanges take place among existing relations that evolve with the transactions carried out. Studies have shown that there are different types of network relationships within innovative firms and that, in order to succeed, firms must expand them (Partanen et al. 2011). These network connections cover a wide range of areas within organizations, from technology – oriented relationships, to relationships with customers, suppliers, competitors, government, universities, and other research institutions (Johanson and Mattsson 1988; Powell et al. 1996; Maurer and Ebers 2006). Building networks and relationships among customers and suppliers becomes particularly important in global business settings, because mutually built and supported relationships allow for better results in the internationalization process. Business transactions with important customers generally take place within well – established, long – lasting relationships, and they require trust, commitment, and knowledge – sharing. Additionally, relationships with customers and other firms in the foreign markets provide unique market information (Rickne 2006) that help reduce liability of foreignness. These relationships with customers and firms become important within the context of this study's empirical research, as will be further discussed.

In the network theory, internationalization goes through different processes. First, there is an *international extension*, in which positions are established in relation to counterparts in nets new to the firm. Thus, in this initial stage, investments are made in the new networks.

Subsequently comes the *penetration*, in which the positions are developed and resource commitments increase in nets where the firm already has positions. Finally, *international integration* takes place, where there is an increasing coordination between positions in different national nets. (Johanson and Mattsson 1988.) The internationalization process through the network theory is summarized in **Figure 3**.

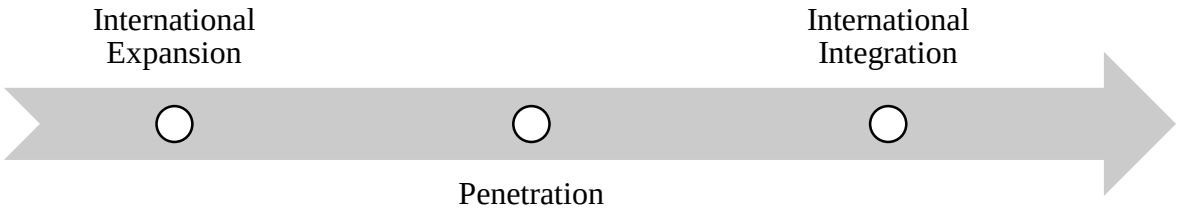


**Figure 3**. Internationalization through the Network Theory (Johanson and Mattsson 1988).

Having connections with networks within foreign markets aids the process of international expansion and fosters survival overseas. Consequently, through an exchange of these elements, the firm gains market penetration. After such process, firms can advance towards international integration by leveraging on the existing network and getting involved with other firms in their diverse markets. Through their position in the network, firms can use their relationships to gain access to markets and resources (Johanson and Mattsson 1988).

As established by Orsenigo et al. (1999), "it is now widely recognized that collaborative relationships are an important form of organization of innovative activities, especially in high technology industries", such as the pharmaceutical sector. Arora and Gambardella (1994) establish that network collaborations represent a new form of development of innovative activities, which are emerging due to the "nature" and "properties" of the learning processes within pharmaceutical research. The increasingly codified and abstract nature of

the knowledge bases on which innovations result (Arora and Gambardella 1994) have fueled the development and evolution of networks (Orsenigo et al. 1999).

# 6. INNOVATION THROUGH INTERNATIONALIZATION

Internationalization and innovation are two comprehensive areas of research that have often been studied independently in business literature. In fact, the previous chapters aimed at studying both concepts separately, in order to provide in – depth theoretical foundations that allow for a better understanding of their relationship, as will be discussed in this chapter. Significant changes in the international economy have pointed to a relevant interconnection amongst them. The increasingly competitive global business environment has made both concepts essential to gaining sustainable competitive advantage, and thus, for growth (Prashantham 2005). In order to conclude the theoretical objective of this study (*TRO: Thoroughly explore the concepts of innovation and internationalization, taking a deeper look into the literature explaining the relationship between both concepts*), the chapter will study the connection between both concepts, leading to the explanation of how internationalization acts as a driver of innovation.

## 6.1. Cumulative causation

During the last several decades, there has been an increase in the interest and publication of ongoing research regarding the connection between innovation and internationalization (Frenz et al. 2005; Onetti et al. 2012). They are both considered important strategic choices that firms adopt (Singh and Gaur 2013), and are gaining increasing attention for their contributions to corporate growth. The relationship between the two is often complex, as there are theoretical arguments why causation could go both ways: innovation to internationalization and internationalization to innovation (Filippetti et al. 2013).

Filippetti et al. (2013) establish that the association between the two phenomena under study is based on strong theoretical grounds, arguing that both are linked by a *cumulative causation*

*mechanism*. Following this logic, the authors state that highly innovative firms can better compete and thus become more internationalized. On the other hand, internationalized firms are exposed to a broader range of cultures and innovative environments that strengthen their innovation performance. Veglio and Zuchella (2015) add that "product, process and managerial innovations can support international growth," while "the exposure to foreign markets enhances learning opportunities," which lead to innovation. According to these views, which cover both sides of the relationship spectrum, innovation provides firms with unique capabilities that allow them to internationalize successfully. However, internationalization allows firms to engage in diversified contexts that, in the same way, enhance their innovation. This latter perspective is what this chapter will further explore and explain.

## 6.2. The internationalization – innovation relationship

Existing research regarding the influence of internationalization on innovation performance has found a positive relationship (Castellani and Zanfei 2006; Frenz and Ietto-Gillies 2005; 2007, 2009; Kafouros et al. 2008). According to Filippetti et al. (2013), innovation is the result of diverse factors operating at the macro, meso and micro levels, and one element underlying these levels is *internationalization*. At a broader level, Altomonte et al. (2013) state that policy measures encouraging internationalization have resulted from the implicit understanding that internationalization is associated with productivity growth, and thus, with economic growth. According to the authors, innovation is the channel through which such growth takes effect.

Internationalization has been argued to have a positive impact on the innovation of firms in several ways. Kafouros et al. (2008) establish that internationalization enhances a firm's capacity to improve performance through innovation, as the innovation – performance relationship of firms is to a certain degree influenced by their degree of internationalization.

As they state, "firms need some threshold of internationalization and to be able to access a broad range of markets in order to benefit sufficiently from their new products and processes." As such, innovation in itself is not enough, and a degree of international participation increases firms' capacity to innovate and reap the benefits of such innovations.

Hitt et al. (1997) establish that the access to foreign markets encourages firms to invest more on innovation projects, leading to improvements in their innovation performance. As such, internationalization in a basic sense is believed to stimulate innovation. Moreover, internationalization essentially allows firms to not only extend their knowledge resources, but also to capture new ideas and knowledge from other markets, which also enhance their innovation performance and intensity. Kotabe (1990) adds that internationalization provides firms with further market opportunities that support their innovations. For example, firms can benefit significantly from the new ideas arising from their diverse markets. Additionally, internationalization allows them to gain in terms of increased inter-firm and inter-region relationships and networks, which arise from the establishment of alliances and cooperation agreements with diverse actors in the markets, such as suppliers, customers, universities, and research centers (Santos et al. 2004). Internationalization also allows employees to benefit from experiential learning and skills – sharing (Hitt et al. 1997).

Moreover, from a financial perspective, internationalization provides favorable contexts that allow firms to reap the economic benefits of innovation. In this economic sense, Sdiri and Ayadi (2014) establish that innovation is regarded as one of the firm's characteristics that can optimize the return to innovation. As established by Kafouros et al. (2008), high technological performance developed through innovation does not necessarily lead to high economic performance, as innovations often require substantial investments, which, along with relatively short life cycles, limit their economic benefits from such investments. Furthermore, as established by Hitt et al. (1997), firms operating in a limited number of markets might not be able to successfully cover the costs associated with innovation. However, internationalization allows firms to take advantage and appropriate the benefits of innovation, consequently enjoying higher returns on such innovations. For example, firms

engaging in international markets can charge premium prices (Kotabe et al. 2002), spread the undergone costs by offering their products to a larger number of promising buyers (Kafouros et al 2008), and benefit from economies of scale (Hitt et al. 1997). **Figure 4**. summarizes the ways through which internationalization drives innovation.


**Figure 4.** Ways through which internationalization drives innovation.

## 6.3. Theoretical evolution of the relationship

With the increasing understanding of the ever – changing nature of MNCs, literature regarding the relationship between internationalization and innovation has seen significant shifts in perspectives throughout the years. In order to understand how the views have changed, this section provides an overview of the theoretical models that have been developed and studied in academia. As will be seen, particular attention is given to the role of knowledge in the relationship between the two phenomena.

Recent studies have emphasized that the innovative success of firms depends on their ability to effectively organize and integrate extensive scopes of internal and external sources of scientific and technological knowledge (Dahlander and Gann 2010; Sammarra and Biggiero 2008). As such, significant weight has been placed on the KBV of the firm previously discussed, which establishes that knowledge from diverse sources contribute to the innovative performance of firms (Grant 1996). This knowledge process and, thus, innovation, is facilitated through internationalization, because as firms expand, they gain access to unique and exclusive sources of information that they can use to innovate in their processes, products, organizational methods, and positions, etc. As such, internationalization is argued to influence the knowledge sources, which leads to driving innovation.

However, the role of knowledge in the process of internationalization as a driver of innovation has not always been considered by research. Earlier theories of the relationship between internationalization and innovation merely stressed the nationality of the investor and, as such, the type of country where the innovative product originated (Frenz et al. 2005). During the 1960's and 1970's, the prevalent theoretical model of innovation development and diffusion in the context of internationalization derived from the International Product Life Cycle (IPLC), developed by Vernon (1966). The view of innovation that developed from the IPLC model related and analyzed innovation in respect to the product rather than the process or the firm as a whole or the industry (Frenz and Ietto-Gillies 2005). In the same way, this product – centered innovation activity was also country and firm – centered.

Furthermore, the theory led to a hierarchical view of innovation potential and activities, which led to several points. It established a hierarchy of countries (the United States, Europe, and developed countries), where the home country played a key role in innovation because, according to the theory, its innate environment helps the firm to build its competitive advantages in innovation. This innovation potential from the home country was linked to various elements, including macroeconomic and technological conditions, under the view that favorable income per capita, a large market, tastes of sophisticated consumers, and labor skills (engineering, production and marketing) create ideal conditions for the introduction of new products. The theory also established a hierarchy of firms (innovative and non-innovative); a hierarchy of products (innovative and imitative), and a hierarchy of potential and actual innovation centers within the firm. Additionally, the IPLC theory was very limited in terms of decentralization of innovative activities. Particularly relevant is that there was limited interaction between subsidiaries, between these and their headquarters, and between subsidiaries and the local cultural and innovation environments of the host countries. (Frenz and Ietto-Gillies 2005; Frenz et al. 2005.) From the this paper's standing point, the IPLC model fails to take into account other sources that support the innovative success of firms through internationalization.

This perspective of innovation changed in the 1980s and 1990s, during which the general view shifted as a result of multiple developments in technology (Cantwell 1989; Frenz et al. 2005). The new information and communication technologies facilitated the transmission of knowledge, the increase in foreign direct investment in services, and the growth in inter – firm collaborative agreements (Hagedoorn 1996; Narula 2000). According to Frenz and Ietto – Gillies (2005), these significant developments changed conditions in the micro and macro economy, which led to new outlooks on innovation. In the same way, the advancements allowed for further economic opportunities that transcended geographical borders. Firms were now seen as evolutionary institutions that had strong and influential interactions with their economic environments, both in national and international levels. During this evolutionary process, internationalization became key because it supported the interactions with these external environments that were facilitated through technological developments.

The evolutionary theory of the firm (Nelson and Winter 1982), has led to new advances in which the behavior and activities of international firms are linked to innovation development and diffusion. The "evolutionary aspect of the firm" was attributed in terms of the way these international firms organize their businesses and in their development of their competitive strategies, amongst which strategies on innovation play significant roles (Frenz and Ietto – Gillies 2005).

Regarding this change in the perspective of innovation, Cantwell (1989), following a strong assessment of the IPLC model in a detailed study of the innovative behavior and outcomes of MNCs from six industrialized countries, developed his own theory. His approach to innovation was derived from the assumption that innovation and technological accumulation are used strategically by managers to enhance firms' competitive advantages. In his approach, he took into account the relevant role of internationalization in the development of these competitive advantages. According to Frenz and Ietto – Gillies (2005), the main points of his theory lay in the following: ownership advantages in innovation can be created; innovation is transmitted internally to the firm from country to country; and there is a high degree of interaction between the firm and its external environment. In addition, the theory leads to the view of internal location advantages, which establishes that innovative activities within companies generate spillover effects and, thus, have external benefits on the local environment (Tushman and Anderson 1986; Cantwell 1989). Furthermore, and particularly pertinent for this study, his approach to innovation established that the subsidiary of an MNC, from its learning of its local environment, increases the scope for further innovation within the company as a whole. Thus, Cantwell's (1989) theory introduced the understanding that through high degrees of interactions with their diverse geographical contexts, firms are able to further develop their innovative performances. As such, it can be argued, that a KBV of the firm was adopted, as it was now understood that as companies interact and learn from their environments through international expansion, they develop knowledge that can be used to innovate within them.

## 6.4. Innovation as a distributed process

Innovation was originally perceived as a linear process, where firms relied almost entirely on knowledge created internally, and thus was characterized by a relatively low need for knowledge integration from external sources (Shearmur et al. 2015). This view has dramatically changed, as more recent understanding of innovation portrays it as an open and distributed process, recognizing the systemic and social dimensions of innovation and, especially, the importance of external knowledge, learning and feedback (Kline and Rosenberg 1986; Lundvall 1992). Currently, it has been argued that in order to compete and extend their core business, firms need to look outside for new knowledge and technologies (Chesbrough and Crowther 2006). This has become a new path towards competitive advantage, and is facilitated through international expansion.

This view on innovation highlights that good ideas can also come from outside the organization (Chesbrough 2003; Chesbrough and Crowther 2006; Laursen and Salter 2006). This view evidently differs from earlier conceptualizations of the innovation process, where firms were considered as the "locus" of innovation, making their internal processes the determining factors (Shearmur et al. 2015). Now, although the internal capacities and processes of firms are still crucial, the role of external knowledge is much more recognized and emphasized (Lichtenthaler and Lichtenthaler 2009; Nieto and Santamaria 2007), significantly contributing to new knowledge in the field of innovation. Currently, external scientific knowledge, such as ideas and technologies, are considered a strategically important driver of performance that may increase a firm's own understanding and serve as the initial phase for future technological developments (Arora et al. 2001; Miller et al. 2007; Kafouros and Buckley 2008). This new innovation paradigm, thus, becomes important in the link between internationalization and innovation the paper aims to explore, because now external knowledge is given additional weight in the innovation process. As such, there is a change in perception that establishes that useful knowledge is widely distributed, and firms must be well connected in order to identify and access it (Shearmur et al. 2015).

As the innovation process continues to open, intermediate markets are arising where firms can interact and conduct business at various stages. These were once closed and occurred only internally within the firm (Dahlander and Gann 2010; Huizingh 2011). According to Nieto and Santamaria (2007), knowledge outflows and technology exploitation lead the firm to leverage its existing technological capabilities beyond its boundaries. On the other hand, knowledge inflows and technology exploration lead the firm to capture and transform knowledge from external sources to modify its current technological capabilities. With the increasing competition in the business environment, this has become pivotal.

### 6.4.1. Internal and external networks as sources of knowledge

Supporting Cantwell's research, MNCs are seen as systems of interdependent units with flows of knowledge, products, and capital (Goshal and Bartlett 1988). Interestingly, Zanfei (2000) views them as networks of innovators, identifying two main types of networks: an *internal network* and an *external network*. Within the MNC context, internal networks form within the headquarters and their subsidiaries, and may cover many countries. On the other hand, external networks form from the business links between the diverse divisions of the company and other independent business units.

Both networks play vital roles in the knowledge transmission of the firm, and thus, have a direct effect on its innovation, as they can either promote knowledge – sharing or hamper it. Internal networks facilitate the transfer of knowledge and innovation to the company (Gupta and Govindarajan 2000; Frenz et al. 2005). Furthermore, Gupta and Govindarajan (2000) add that when local subsidiaries are given flexibility, they are able to engage in cooperative agreements with their environments. On the other hand, while internal networks help to transfer the knowledge across the firm and its different parts, external networks facilitate the links formed between the company and its local and foreign environments. According to Amara and Landry (2005), external sources can come from the market, such as clients, suppliers, competitors, and service firms; institutions, such as education and research

establishments, and public and private research laboratories and institutes; or other external sources, such as conferences, trade fairs, scientific journals, trade or technical publications, and professional and industrial associations.

### 6.4.2. Centralized versus decentralized organizational structure

The process of knowledge transfer within internal and external networks is highly influenced by the organizational structure adopted by firms. As such, there are conflicting views regarding the *centralization* and *decentralization* of firms. For example, Zanfei (2000) argues in his model that internal knowledge transfer is facilitated by a fairly *centralized* organization with strong central forces. This seems reasonable, as a centralized organization has greater internal coordination, which facilitates the information shared within the parts of the organization. However, this view might give for granted that this organizational structure does not necessarily support the external knowledge transfer of the firm. As such, the author states that external transfers and spillover effects are facilitated by a more *decentralized* organizational structure. This centralization – decentralization conflict has implications for the learning process and the spread of innovation (Frenz and Ietto-Gillies 2003), as, in the context of internationalization, innovation is largely dependent on knowledge.

Cantwell's (1989) perspective of innovation, in which such innovation develops and spreads across national boundaries, establishes that the international expansion of firms plays a vital role, as well as the internal networks and the integration of parts within the local environments in which the MNC operates (Frenz et al. 2005). An effective and consistent integration between the internal and external networks of firms facilitates the transfer of knowledge and, thus, contributes to the innovation of firms. His approach then shifts towards a decentralized, network – centered view of innovation development (Cantwell 1989; Frenz et al. 2005). In other words, particular attention is put on the integration within the group and the external environment, rather than on a hierarchy. Other research support this outlook. Goshal and Bartlett (1988) stress the importance of connections amongst the dispersed units of the company for innovation processes. Hedlund (1986) shifts from the traditional

hierarchical structure of the firm to a *heterarchy*. As the author establishes, this entails a "geographical diffusion of core strategic activities and coordinating roles", along with a focus on "normative control mechanisms."

## 6.5. Overview of discussion

From the discussion, it has been found that firms that engage in internationalization are more likely to innovate, mainly because their resources, products, and institutions are exposed to alternative innovation contexts, allowing them and their employees to learn from different environments (Amendola et al. 1993; Kafouros et al. 2008; Filippetti et al. 2013). Furthermore, having foreign operations increases investments in innovation, provides external knowledge sources, and allows for increased experiential learning (Hitt et al. 1997). In addition, internationalization presents further market opportunities for innovation (Kotabe 1990), fosters relationship and networks (Santos et al. 2004), and allows for significant economic advantages (Kotabe et al. 2002; Kafouros et al 2008; Hitt et al. 1997).

As has been established, knowledge plays an essential role in how internationalization drives innovation. Frenz and Ietto-Gillies (2005) state that having international participation allows for a greater development and diffusion of knowledge and innovation. Through their international divisions, MNCs learn from the diverse local environments, and can extend the innovation effects into the locations in which they operate. By expanding internationally, MNCs have access to unique and exclusive "bundles" of information that allow them to innovate through their products, processes, services, etc. Scholars have established that companies that operate in diverse countries learn from different innovation contexts and, thus, are able to benefit from them with the necessary absorptive and innovative capabilities (Dunning and Wymbs 1999; Castellani and Zanfei 2006; Frenz and Ietto-Gillies 2007). **Figure 5**. presents a framework that depicts the role knowledge in the process of internationalization as a driver of innovation.

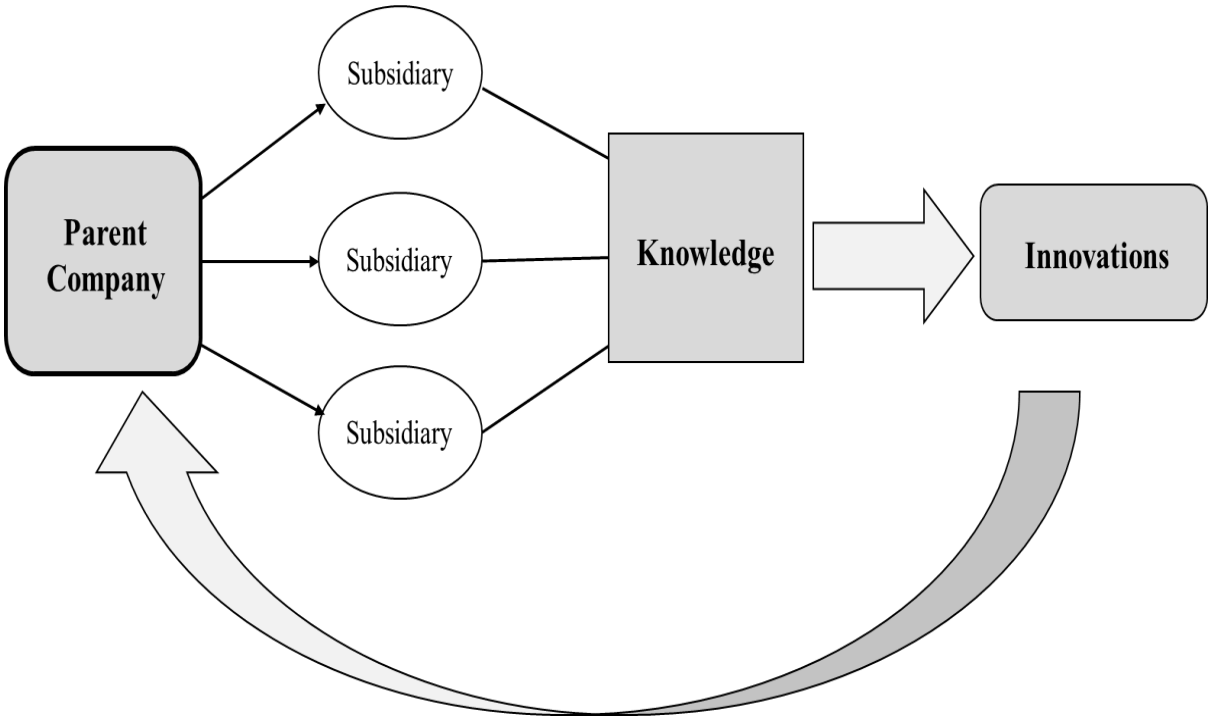


**Figure 5.** Knowledge in the process of internationalization as a driver of innovation.

The framework presented above, developed for this study, depicts the role of knowledge in how internationalization drives innovation. As is known from theory, through internationalization, MNCs have diverse international subsidiaries that interact with their particular geographical environments. From their access to exclusive sources of internal and external information, these foreign divisions develop unique knowledge, which transform into innovations that are transferred to the parent company and further implemented within the foreign subsidiaries.

# 7. RESEARCH METHODOLOGY

This chapter presents the methodological structure of the study. Firstly, the research approach will be discussed. Following, the research design is presented, along with the research purpose and strategy. Afterwards, the data collection methods and techniques are explained. Finally, the credibility and ethical considerations of the paper are presented.

## 7.1. Research approach

Prior to designing the research, it is important to be clear about the research approach, which can be *deductive* or *inductive*. Under the *deductive approach*, theory is the first source of knowledge and deductions are built on such theory, with the aim of testing it (Saunders et al. 2009: 124). As established by Hyde (2000), "deductive reasoning is a theory – *testing* process which commences with an established theory or generalization, and seeks to see if the theory applies to specific instances." The *inductive approach*, on the other hand, uses the empirical data collected from the research as the first source of knowledge. As such, the study derives from practical research, leading to formulations resulting from the data analysis. The main purpose of this approach is to understand what is going on, in order to comprehend the nature of the problem. (Saunders et al. 2009: 126). Hyde (2000) defines it as "a theory – *building* process, starting with observations of specific instances, and seeking to establish generalizations about the phenomenon under investigation." It is important to clarify that even though the deductive approach is commonly associated with quantitative research, literature suggests that this is not always the case. As established by Hyde (2000), associating deductive approaches merely to quantitative studies "does not fully nor accurately describe the processes adopted by quantitative and qualitative researchers in practice." The author adds that "both quantitative and qualitative researchers demonstrate deductive and inductive processes in their research." Furthermore, despite the differences between the two approaches, they can, and should, be combined, which is why studies rarely

follow only one approach. As suggested by Saunders et al. (2009: 127), applying both approaches to the research is often advantageous. The combination of the deductive and inductive approaches leads to what is known as an *abductive approach*.

For the purpose of this study, an *abductive approach* was adopted. This is due to the fact that previous theories and assumptions regarding the influence of internationalization on innovation have been formulated, as discussed previously in the literature review of the study. However, these theoretical contributions have not been examined within the particular industrial context of this research. As such, from the new empirical findings, the previous theories and models will be further explored within the research spectrum, leading to new empirically – based assumptions.

## 7.2. Research design

A *research design* is a logical and systematic plan that allows a researcher to direct a study (Krishnaswami and Satyaprasad 2010: 40) and go about answering the study's research question(s) (Saunders et al. 2009: 136). Choosing the appropriate design and methodological approach to a research can be very challenging, but also extremely important, as it facilitates the successful development of the investigation that is being conducted. In essence, a research design contains clear objectives, specifies the sources of data collection, and takes into consideration potential constraints (e.g. access to data, time, and location) and ethical issues in the design, as well as the reliability and validity reasons for the choice of design (Saunders et al. 2009: 137).

When conducting research, it is crucial to have a clear *purpose* of the study being conducted. In this way, we will know how to approach the selection of research methods and tactics. The purpose of the research derives from the research question(s), which will result in either descriptive, descriptive and explanatory, or explanatory answers. As established in literature,

the research purpose is mainly classified into three types: *exploratory*, *descriptive*, and *explanatory*. However, it is possible for studies to have more than one purpose. *Exploratory studies* aim at exploring "*what* is happening." In this sense, they seek to understand a phenomena in new light and derive new, different insight. The three primary ways of conducting exploratory research are: searching of literature, interviewing experts, and/or conducting focus group interviews. On the other hand, *descriptive studies* provide a definite description of the phenomena under study, laying a foundation for the research. They do not often identify or correlate relationships amongst variables, but may be used as an extension or support of exploratory or explanatory research. As such, they are considered a means to an end and not an end in itself. Finally, *explanatory studies* seek to establish causal relationships between variables. Under this approach, a situation or problem is deeply studied, further leading to explanations of the connections between variables. (Saunders et al. 2009: 138 – 140). The present research follows a combination of exploratory and explanatory studies. The paper is exploratory because it aims to explore "*what*" internationalization and innovation mean within the MNC context and Puerto Rico's pharmaceutical industry, and what are the roles they play. On the other hand, it is also explanatory because it seeks to understand "*how*" both concepts are related and "*how*" internationalization drives innovation.

As data is a very broad concept, it is classified into two main types: *quantitative* and *qualitative* (Punch 2013: 3). According to Saunders et al. (2009: 151), the terms are used extensively in business and management research to differentiate between numeric or nun numeric data collection techniques and data analysis procedures. Differentiating between the two types of data is important in order to ensure the correct analysis of the evidence. Quantitative research is conducted mainly in the forms of surveys, mathematical modelling, statistical analysis, and econometrics. On the other hand, qualitative data sources come from observation, interviews, questionnaires, documents, texts, and the researcher's impressions and reactions (Myers 2013: 7 – 8). According to the author, within business research, a quantitative approach is best if the researcher wants to investigate a large sample, for example, a particular topic across many people or many organizations (2013: 8). However,

a qualitative approach is the most appropriate choice if the researcher wants to study a particular subject more in – depth, as for example, in one or a few organizations (Myers 2013: 9). As established by Eriksson and Kovalainen (2008: 4), qualitative research "gives the researcher an opportunity to focus on the complexity of business – related phenomena in their contexts." This study will adopt a qualitative approach. The research focuses on studying how internationalization drives innovation within Puerto Rico's pharmaceutical industry, selecting several key organizations and people in order to analyze such relationship more in – depth. Additionally, while there are theoretical contributions to how internationalization drives innovation topic, they are modest in amount, as literature has mainly focused on the influence of innovation on internationalization, and not the other way around. Given this analysis, qualitative data is better suited for the study.

Following the identification of the research purpose and type of data, the next step in the research design is selecting the appropriate research *strategy*. While there are diverse strategies, some are better suited depending on certain factors. When selecting a strategy, Yin (1994: 4) states that the process is determined by three main conditions: the type of research question(s); the extent of control an investigator has over actual behavioral events; and the degree of focus on contemporary as opposed to historical events. Saunders et al. (2009: 141) add that, aside from the research question(s) and objectives, a research strategy will be guided by the extent of existing knowledge, the amount of time and other available resources, and the researcher's own philosophical foundation. No research strategy is superior or inferior to any other (Saunders et al. 2009: 141). They are simply diverse approaches that investigators adopt in order to answer their research questions.

The *case study* was selected as the research strategy of this paper. Eisenhardt (1989) defines the case study as a "research strategy which focuses on understanding the dynamics present within single settings." Yin (1994: 13) states that it "investigates a contemporary phenomenon within its real – life context, especially when the boundaries between phenomenon and context are not clearly evident," adding that multiple sources of evidence can be used. These sources of evidence may include interviews, observation, and

documentary analysis, amongst others (Eisenhardt 1989; Saunders et al. 2009: 146). It is argued that case studies are most appropriate when studying topics that have not yet attracted much previous research attention (Vissak 2010), which applies to this paper because research has mainly focused on innovation as a driver of internationalization, and not the other way around. This paper aims to study the phenomenon of internationalization and how it drives innovation, taking Puerto Rico's pharmaceutical industry as the case of study. Case studies also allow for a multi – faceted approach to research, as they provide space for confirmatory (deductive) as well as explanatory (inductive) findings (Hyde 2000; Baškarada 2014), both of which are covered in this study under the abductive approach. Furthermore, case studies can include both quantitative and qualitative data, and can be based on single or multiple cases (Yin 1994: 14; Eisenhardt 1989).

This study will adopt a multiple cases approach. The rationale behind this decision is the interest in identifying and exploring patterns and differences within Puerto Rico's pharmaceutical industry and, subsequently, the interest in forming empirically – based assumptions from these findings (Saunders et al. 2009: 147). In this study, leaders from diverse organizations, all of which have extensive experience within the industry, took part of the research. This was intentionally designed in order to present diverse perspectives. In this study, a multiple case focus seemed more appropriate because it provides a broader view of how internationalization drives innovation within Puerto Rico's industry. Moreover, case studies can be exploratory, descriptive, or explanatory, although they are the preferred method for exploratory and explanatory studies (Yin 1994: 1; Saunders et al. 2009: 146). Saunders et al. (2009: 146) establish that case studies provide the best contexts for comprehensive answers to "*what*?" and "*how*?" research questions, which represent the line of questioning of this study's research: RQ 1: w*hat do innovation and internationalization mean within Puerto Rico's pharmaceutical industry?*; and RQ 2: *how is internationalization perceived to drive innovation within Puerto Rico's pharmaceutical* industry*?*

## 7.3. Data collection

As previously mentioned, qualitative case studies gather data mainly from interviews, observation, and written documentation (Eisenhardt 1989; Saunders et al. 2009: 146). To generate the findings of the study, the paper conducted research through two main strategies: qualitative interviews and document analysis, thus adopting a multiple – methods qualitative approach. These comprise the primary and secondary data of the paper, respectively. While primary data consist of the new empirical evidence found through the direct interviews, the secondary data include published transcribed interviews (Saunders et al. 2009: 256).

Interviews can be divided into three main types: *structured interviews*, *semi – structured interviews*, and *unstructured or in – depth interviews* (Saunders et al. 2009: 320). In *structured interviews*, researchers ask questions based on pre – determined or identical sets of questions. However, they are mostly used to obtain quantifiable data, for which they are commonly referred to as "quantitative research interviews." As such, they will not be used for this study. On the other hand, in *semi – structured interviews*, researchers have a main list of themes and questions, but the selection of questions may vary from interview to interview. In addition, some questions may be omitted in particular interviews given a particular organizational context. As such, this type of interview allows for more flexibility regarding the interview framework. Also, in semi – structured interviews the tone is generally conversational and informal, and in – depth questions are also possible. Finally, *unstructured interviews* are informal, in which there are no pre – established lists of questions, although a clear idea about the topic to explore is needed. (Saunders et al. 2009: 320 – 321). For the purpose of this research, a *semi – structured* interview approach was adopted, where there was a list of pre – determined questions, but these were slightly modified depending the position of the respondents. Additionally, the interviews evolved from the conversations with the participants, leading to additional in – depth questions and answers. Regarding the secondary data used for the study, previous transcribed interviews

to industry leaders were used in order to further analyze the influence of internationalization on innovation.

### 7.3.1. Selection of the sample

A crucial step when selecting the sample is selecting an appropriate sampling technique that allows the researcher to effectively answer the research questions. In this case study research, a *non – probability sampling* (non – random sampling) was selected. This type of sampling provides a wide range of alternative techniques to select samples based on the researcher's subjective judgement (Saunders et al. 2009: 233). The specific non – probability sampling techniques adopted in this research were *purposive* and *snowball* sampling. *Purposive* sampling, also referred to as *judgmental* sampling, enables researchers to use their own judgement to select cases that will best allow them to answer the formulated research questions and to meet the established objectives (Saunders et al. 2009: 237). In other words, it allows researchers to actively select the most productive sample (i.e. specific respondents that are believed to provide the highest quality answers) (Marshall 1996). This sampling technique was selected because the study seeks to concentrate on people with particular characteristics who will be better equipped to assist and provide relevant and valuable information that answer the research questions. As such, in order to provide an accurate depiction of how internationalization drives innovation within Puerto Rico's pharmaceutical industry, the participants of the study complied with certain characteristics: have vast experience within the industry, work for or with companies that have extensive international involvement, and be active leaders within the industry. In addition, the purposive sampling technique is commonly used when working with very small samples (Saunders et al. 2009: 236), which applies to this study because not many firms comply with the criteria, and since the pharmaceutical industry is highly regulated, it is more challenging to get in contact with a larger sample. It is important to add, however, that the validity, understanding, and insights gained from data have more to do with the data collection and analysis skills of the researcher than with the size of the sample (Patton 2002). Within purposive sampling, there are diverse

strategies that can be adopted. This study used a *heterogeneous sampling* strategy, which allows for the collection of data to describe and explain themes that can be observed (Saunders et al 2009: 239). While the study focuses on a particular group in which the sample members are part of the pharmaceutical industry, they work in diverse companies, and thus present diverse perspectives. A weakness of the purposive technique is that it may be subject to bias, since the sample is selected almost entirely based on the judgment of the researcher. However, despite this possible partiality, purposive sampling can provide reliable and robust data. (Dolores and Tongco 2007). The bias will be controlled by analyzing the empirical data as it is offered and not providing interpretations beyond the sampled population.

The *snowball sampling* technique was also used in this research. Snowball sampling occurs when respondents are obtained through the referral or identification of the original respondents (Saunders et al 2009: 240). While most respondents were contacted directly, some companies and people that were initially contacted identified further members of the population that they believed were better equipped to answer the questions and meet the study's objectives. This technique is mostly used when it is hard to reach key people, and is beneficial because people are more likely to respond if they are referred to by other individuals they know. This allows researchers to come in contact with people that meet the established sample criteria. As weaknesses, Saunders et al. (2009: 240) point out that this technique allows for bias and the likelihood of the sample being representative is low. However, this study does not aim to be representative of the industry, but rather study the internationalization – innovation relationship as it is perceived by the respondents, and add to literature by shedding some new light on the subject.

As mentioned, the sample that makes up this study comprises a purposive selection, representative of diverse leaders within Puerto Rico's pharmaceutical industry. Due to time and geographical constraints, seven respondent were directly interviewed. However, their answers offer a comprehensive outlook of innovation and internationalization within Puerto Rico's pharmaceutical industry, and how the latter is perceived to drive the former. Furthermore, four additional secondary transcribed interviews published on an online

pharmaceutical portal were also used as supplementary data in some parts of the analysis. Thus, a total of eleven respondents make up the sample, in order to present what innovation and internationalization mean to the industry, and provide an ample and contextualized description of how internationalization is perceived to influence innovation within Puerto Rico's pharmaceutical industry.

One of the criteria for the selection of respondents was that they had vast experience within the pharmaceutical industry, in order to be able to provide valuable insight regarding the influence of internationalization on innovation and the recent changes that the industry has experienced regarding these two concepts. Currently, much weight is being put on both internationalization and innovation, for which this study aimed to contact influential leaders that have been key in the internationalization – innovation movement within Puerto Rico's pharmaceutical industry. The participants' experience in the industry ranged from 11 to 40 years. Another main criteria was that the firms represented by the respondents had extensive international participation. In the case of the consulting firms, this criteria was covered because they work with global MNCs, thus presenting their insights based in their experiences with their clients. An additional criteria was that the respondents had active leadership participation within the industry.

### 7.3.2. Overview of sample

As previously discussed, the empirical part of the research focuses on exploring how internationalization drives innovation within Puerto Rico's pharmaceutical industry. The interviewed respondents were selected amongst a group of executives who are part of the *Pharmaceutical Industry Association of Puerto Rico* (PIA – PR), which gathers and represents research – based multinational pharmaceutical and biotechnology companies with operations on the Island (PIA 2015). Four of the seven direct respondents are part of the leadership of PIA – PR, either as part of its Board of Directors or as leading members of its committees. Three other respondents are partnered with PIA – PR through their Affiliate Membership Programme, which includes a select group of pharmaceutical industry

suppliers, vendors, consultants, and professionals that work along the organization. The respondents that make up the study occupy leading positions within their respective companies, ranging from Presidents, CEOs, and Executive Directors, amongst others. These respondents were selected because top management is naturally highly involved in the operations and decision – making of their companies, and thus, are most likely to have first – hand knowledge of the impact of internationalization on the innovation of their companies. In order to respect the confidentiality of the interviewed participants, their names and companies will be kept anonymous and will be represented by numbers and letters, respectively. The published transcribed interviews that make part of the findings, on the other hand, will include the respective references, as they are part of a series of interviews that were conducted to several leaders within Puerto Rico's pharmaceutical industry on *PharmaBoardroom*, an online pharmaceutical portal. The companies represented by the respondents that were directly interviewed can be found in **Appendix 1**.

The focus of the study is at an industry level. As such, the respondents of the study present diverse perspectives, and they have spoken based on their experiences in different organizations within the industry. **Table 2.** presents an overview of the respondents.

**Table 2**. Overview of respondents interviewed.

| Title | Company | Position | Years in company | Years in industry |
|---|---|---|---|---|
| Respondent 1 | Company A | President & CEO | 18 years | 23 years |
| Respondent 2 | Company B | President & CEO | 5 years | 20 years |
| Respondent 3 | Company C | Executive Director | 5 years | 11 years |

| | | | | |
|---|---|---|---|---|
| Respondent 4 | Company D | President & General Manager | 4 years | 26 years |
| Respondent 5 | Company E | Legal consultant | 37 years | 37 years |
| Respondent 6 | Company F | President | 5 years | 35 years |
| Respondent 7 | Company F | Senior consultant | 5 years | 40 years |

As previously mentioned, several additional transcripts of interviews were also used as support for some of the empirical analysis of this study. These interviews were obtained through *PharmaBoardroom*, an online pharmaceutical portal which conducted a recent study on Puerto Rico's pharmaceutical industry, interviewing several leaders of the industry. **Table 3.** presents an overview of the respondents of the transcribed interviews. Since these interviews are published in an online pharmaceutical industry portal, the information of the participants and companies are provided.

**Table 3.** Overview of respondents of published transcribed interviews.

| Name | Company | Position |
|---|---|---|
| Ileana Quiñones | iPR – AstraZeneca, Puerto Rico | President and General Manager |
| Dante Castillo | Haemonetics, Puerto Rico | Managing Director |
| Fabrice Chouraqui | Novartis, Latin America and Canada | President |
| Andrew Wirths | Merck, Puerto Rico | Associate Vice President & General |

| | | |
|---|---|---|
| | | Manager |

### 7.3.3. Structure of the interviews

Due to geographical constraints, the seven primary interviews of this study were conducted via telephone and were recorded with the consent of the participants. They were administered between March and April 2016, and lasted from 30 to 60 minutes. Telephone interviews are quickly becoming one of the primary methods of obtaining information from participants in international business research (Neelankavil 2007: 214). While the absence of face – to – face contact does not allow for the analysis of other sources of hidden information, such as facial reactions and body – language, the dynamics formed with the respondents through the telephone provided a comfortable space that encouraged the sharing of valuable information and personal experiences that are believed to greatly contribute to the study. As such, not being able to interview face – to – face was not a limitation to obtain relevant data. In addition, research suggests that telephone interviews are often advantageous because, since respondents do not see the interviewer, they are generally more willing to answer confidential and more complex questions (Neelankavil 2007: 215). During the interviews, notes of the most important points and details were taken.

In order to coordinate the interviews, prior communication was established with the participants and/or their administrative coordinators through emails and/or telephone calls. Every respondent was sent an initial email explaining the study and the reasons for their selection as potential participants, given their experience within the industry and their company's international participation. Additionally, a resume of the interviewer was attached to the email in order to formalize the approach and provide a description of the interviewer's academic and professional background. After a first communication was established and an agreement made, a date was set and the outline of the interview questions was sent (Appendixes 2 and 3). Following the semi – structured approach of the interviews

previously discussed, the question outlines varied slightly depending on the respondents' positions and types of companies. The questions, while mostly the same, adapted to their professional contexts.

Once each interview started, the interviewer formally presented herself and provided an additional explanation of the study and the objectives of the research. The participants were informed that the data would be managed confidentially and were thanked for their participation. Once the introduction was completed, the interviewer moved on to ask the interview questions. As the discussions evolved, additional questions were made in some cases, depending on the perceived willingness of the participant and the direction of the conversations. After each interview was finished, the participants were once again thanked for the time and valuable contribution to the study.

Given that Spanish is the native language of all the participants involved, the interviews were conducted in such language and later translated to English by the interviewer. Despite the respondents having at least basic knowledge of the English language, Spanish was selected as the language for the interviewing process in order to respect the participants, facilitate the interviewing process, and encourage active and in – depth discussions. Conducting the interviews in English or any other language might have hampered the discussions and resulted in less information and/or less active participation.

## 7.4. Data analysis

The study firstly presents a theoretical review of existing literature regarding the phenomena of innovation and internationalization, and the relationship between the two. As established by Saunders et al. (2009: 490), starting from a theoretical perspective has several advantages. For example, it helps investigators link the research into the existing body of knowledge in the subject area, helps to get started, and provides an initial analytical framework.

Establishing a theoretical outline is extremely helpful, mainly because the extensive amount of information can shift the focus of the study. Further, this allows the researcher to draw from the theory and develop a descriptive framework.

The aim of this study is to gather and further analyze new, empirical data, in order to add to existing literature. After obtaining the data from the interviewees, an extensive analysis was conducted with the purpose of studying the phenomena under new light. In order to introduce a clear presentation of the findings, after the extensive collection of data, the researcher organized it by summarizing (condensing), categorizing (grouping), and structuring (ordering), as suggested by literature (Saunders et al. 2009: 490).

After the interviews were conducted, verbatim transcripts were made. From such transcriptions, the analysis began, where themes were identified according to the answers provided. Using the previous theoretical framework presented in the study, the answers were categorized and structured. For example, the literature review discussed the two most important elements under study: *innovation* and *internationalization*. As such, the empirical analysis includes what these two concepts mean within the studied industry. Furthermore, following the theoretical discussion regarding how internationalization drives innovation, the empirical analysis presents how this relationship is perceived to take place within the industry. Throughout the empirical discussions, the answers were grouped according to the themes that emerged, presenting similar and/or diverse perspectives of the topics under discussion, thus introducing patterns and unique findings. Direct quotations from the interviews were included in order to present their exact contributions and the evidence for the analysis.

## 7.5. Credibility

Assuring the credibility of research findings has been an ongoing research design issue within literature (Saunders et al. 2009: 156). According to the author, in order to reduce the

possibility of wrong answers and assumptions, careful attention must be given to two particular elements of the research design: *reliability* and *validity*.

### 7.5.1. Validity

Validity concerns the findings of the study being really what they appear to be about (Saunders et al. 2009: 157). In this sense, it relates to using methods that allow the researcher to obtain accurate data that answer the research questions and meet the study's objectives. In other words, how convincing the evidence is. Yin (1994: 33 – 36) establishes that in empirical research, including case studies, three aspects within the standard notion of validity must be examined: *construct validity*, *internal validity* (for explanatory or causal case studies), and *external validity*.

*Construct validity* is "the extent to which a measurement method accurately represents a construct and produces an observation distinct from that produced by a measure of another construct" (Baškarada 2014). As stated by Yin (1994: 37), it relates to establishing sufficient and correct operational measures for the concepts under study and collecting data objectively rather than subjectively. Simply put, it is the foundation of the research. This study seeks to ensure construct validity by committing to the research design, techniques and strategies justified in this chapter, and treating the evidence objectively, as is presented. Further, *internal validity*, which concerns only explanatory and causal studies, relates to the extent to which the causes of an effect are established by the research (Baškarada 2014). It concerns when assumptions are made regarding certain conditions that are shown to lead to other conditions (Yin 1994: 33). This paper aims to closely study the influence of internationalization as a driver of innovation. Thus, a correlation between both concepts is sought. However, in order to make accurate inferences about the relationship and address the study's internal validity, the paper formulates correlations based on existing research and on the exact contributions (i.e. quotes) of the respondents. These comprise the foundation that support the researcher's arguments and empirical analysis. As such, additional assumptions which are not supported by the data obtained are not be made. Lastly, *external*

*validity* relates to the extent of the generalizability of the findings. Particularly, whether the findings are generalizable "beyond the immediate case study" (Yin 1994: 35). This type of validity is a special issue within case study research, even more so if it is conducted in one organization or a small number of organizations (Saunders et al. 2009: 157). Case study samples should not be generalized to a "larger universe," as they rely on *analytical* generalization, rather than *statistical* generalization, as in the case of survey research (Yin 1994: 36). As established by the author, in analytical generalization, the researcher seeks to generalize a particular set of results to broader theory. As such, the purpose of case study research, especially those with small samples, is not to produce a theory that is generalizable to all populations, but to add to existing research by explaining what is going on within the particular research setting and identifying possible correlations with previous theoretical contributions (Saunders et al. 2009: 158). Thus, the findings of this research should not, and are not aimed to, be generalizable beyond the studied sector. They solely seek to provide further knowledge about how internationalization drives innovation, paying particular attention to a specific industrial context: Puerto Rico's pharmaceutical sector. Additionally, to ensure a validity of the research, the study triangulates findings from diverse independent data sources (Saunders et al. 2009: 277), which explains the primary and secondary data used for the research. As established by Baxter and Jack (2008), "triangulation of data sources, data types or researchers is a primary strategy that can be used and would support the principle in case study research that the phenomena be viewed and explored from multiple perspectives."

### 7.5.2. Reliability

Another important element concerning the credibility of research is reliability, which is defined as "the extent to which a measurement process produces similar results on repeated observations of the same condition or event" (Baškarada 2014). In other words, it relates to maintaining consistency in the operations of a study, such as the processes of collecting and analyzing data, in order to ensure that if the processes are repeated on the same case and under the same conditions, they would produce the same results. The goal is to minimize

errors and biases (Yin 1994: 36). The author establishes that in order to ensure the reliability of case studies, researchers should thoroughly document the research procedures followed. This study has done so by discussing in detail the research techniques and data collection methods, as well as the justifications for those choices. Additionally, in order to ensure the reliability and truthfulness of the data provided by the interviewees, these were informed that their contributions were confidential, thus encouraging the sharing of accurate information. Further, before conducting the interviews, the participants were sent emails with descriptions of the study and the aim of the interviews. As such, they agreed to participate only if they were knowledgeable on the subject and were able to provide reliable information. Also, during the interviews, clarifications were made if there were any questions left unclear, enhancing their understanding of the issues being presented.

## 7.6. Ethics

Ethics in research concerns the researcher's moral standards of conduct in relation to the moral entitlements of the people who are subject of the research or are in any way affected by it (Saunders et al. 2009: 183). In other words, respecting the rights of those who participate in the study and avoiding doing any harm. According to Orb et al. (2001), the nature of ethical issues within qualitative resort is different than that of quantitative research, as potential problems in qualitative studies often concern how the researcher gains access to a group and the effects the researcher may have on the participants. Thus, researchers must ensure that the way the research is designed is "both methodologically sound and morally defensible to all those who are involved" (Saunders et al. 2009: 184). Additionally, the participating organizations and respondents have the right to expect quality research which takes account of existing knowledge (Saunders et al. 2009: 187). Thus, as a researcher in business, there is a responsibility to analyze and report the data gathered in all accuracy and veracity, as they were originally provided by the participants. This was achieved by basing the findings and arguments on the exact contributions gained through the primary and

secondary data sources (i.e. direct interviews and transcribed interviews). Furthermore, in order to comply with the ethical commitment of the paper, the confidentiality of the participants was respected, and the interviews and data collection only proceeded if there was absolute consent, deriving from the voluntary nature of the respondents (Saunders et al. 2009: 185). In addition, the paper applied ethical measures throughout the research by appropriately making reference to all the previous studies that were used to support the study.

# 8. EMPIRICAL FINDINGS AND DATA ANALYSIS

This chapter presents and analyzes the findings of the interviews conducted for this case study. This empirical analysis aims to provide a comprehensive depiction of what innovation and internationalization mean to diverse leaders within the pharmaceutical industry in Puerto Rico, and explain how internationalization is perceived to drive innovation within the industry. Thus, following the empirical research objectives and theoretical background of the study, this chapter presents the data obtained, with the aim of answering the research questions.

The chapter is divided into three main sections. The first and second sections will discuss the concepts of *innovation* and *internationalization*, respectively, from the diverse perspectives of the participants. As such, this covers the first research question of the study (RQ 1: *What do innovation and internationalization mean within Puerto Rico's pharmaceutical industry?*). Given that both topics are the main concepts under study in this paper, studying them within the particular context of Puerto Rico's pharmaceutical industry will provide existing literature with a unique perspective of their importance within the field of international business. The third section will present how internationalization is perceived as a driver of innovation within Puerto Rico's pharmaceutical industry, leading to the second research question of this study (RQ 2: *How is internationalization perceived to drive innovation within Puerto Rico's pharmaceutical industry?*).

## 8.1. Innovation within the pharmaceutical industry

As discussed in the literature review of this research, innovation is as a "multistage process whereby organizations transform ideas into new/improved products/services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace"

(Baregheh et al. 2009). It can take diverse forms, yet the consistent variables are novelty and/or improvement. Innovation has been a recurring topic within the pharmaceutical industry, made evident through the empirical data gathered. As established by Petrova (2014: 20), "the pharmaceutical industry is essentially defined by innovation." The author argues that scientific research, the creation of new knowledge bases, the invention of new medications, and the improvement of existing drugs, embody the fuel that drives the firms within such industry.

In order to follow a structure that propels the understanding of how internationalization drives innovation, it is important to first comprehend what *innovation* represents to diverse leaders within Puerto Rico's pharmaceutical industry. As such, the participants of the study were asked to explain what innovation meant to them, and how important they believe it is for the industry. Further in the chapter, the diverse types of innovations considered in literature are discussed, as well as the strategies associated with innovation. In order to present a broader picture of innovation within the industry and provide additional support to the empirical findings, several perspectives of other leaders within Puerto Rico's pharmaceutical industry obtained through published transcribed interviews are also presented.

### 8.1.1. Meaning of innovation

The empirical data gathered support the theoretical notion that innovation concerns creating new things or doing things in different ways, and the ability to adapt to changes (Kanter 1984: 20). As Respondent 1 states, innovation has two slopes: doing new things or finding ways of changing them and making them better. In other words, creating or making improvements that make the company more efficient in its processes, services, etc. In terms of adapting to changes, it is interesting to see how Company A has complied with the industrial changes by identifying opportunities and adapting their organizational framework to the business models of their clients, in order to meet and supply their needs. According to Pisano (2015), business model innovation has become very relevant in recent years, which

is the case for Company A, as their complete operational approach is constantly being modified in order to stay competitive and up – to – date with the industry. The company has also incorporated technology as a main source of innovation, which has propelled the efficiency of their systems and, thus, organization. As Pisano (2015) establishes, technological innovation has historically been an essential creator of economic value and a pivotal driver of competitive advantage. Respondent 1 highly values what the company calls "mini-innovations."

> *"Innovation has two sides: do new things or do existing things in different ways. For me, perhaps the greatest innovation we do in the company is the way we work business models [...] That for us is an innovation. On the other hand, we can have a performance evaluation and then modify it, or we want to do something new or to change it, and that it is also an innovation because we are continually changing for the better [...] its doing the same thing differently. Those are basically the two ways, but they are key because they are the way you revive the company, how you keep it alive and well, and also keep it attending the new modalities that are emerging [...] Another fundamental element is technology. The way technology evolves lets you do things that maybe you could not do before, and you can do what you were doing but differently."*

(Respondent 1, Company A)

Respondent 2 also supports the notion of innovation as novelty, as it is "*all that has not been done*." The respondent adds to this perception by establishing that in Company B, innovation is applied mainly to how their services are *delivered*. Furthermore, and particularly interesting, in Company B, innovation does not only concern *creating* new things, but also offering the same services to a wider range of people. In this sense, novelty is applied to *how* they deliver their services and the *reach* of those services. This presents an interesting contribution to the research, as there is an important relationship between internationalization and innovation. In this sense, it can be argued that internationalization is considered a type of innovation, because to the extent that the company reaches larger markets, they are innovating. Respondent 2 states that innovation plays an essential role

within the industry, as the advancements achieved through pharma have changed the world's development.

> *"Innovation is all that has not been done, taking into consideration that we are not only referring to products, but also services, and that we are referring [...] to a service that had not been provided before in a specific market or region. [...] Innovation is something that not only moves the industry, but that has been moving the world. [...] The world would not have been able to develop without the new knowledge and the new medical applications that we have had."*

(Respondent 2, Company B)

Respondent 7 also supports the view that innovation comprises new changes and improvements. Additionally, technology has an important role within the innovative technologies that are developed.

> *"One could think that there is an innovation where you take existing processes and improve them, making substantial changes to improve the performance, lower the cost, or to eliminate problems that they cause. [...] The industry we represent is based on innovation, it is constantly looking not only for new products, but also new technologies and new methods to make the products."*

(Respondent 7, Company F)

Furthermore, Respondent 5 also supports the previous contributions by establishing that innovation concerns doing new things ("*inventing"*) or improving them ("*reinventing"*). Interestingly, the respondent adds that innovation can take place either proactively or reactively. In other words, that it can adopt either a leading role within the industry or a follower approach, reacting to the changes in the industry. In addition, the respondent recognized the crucial role of innovation within the pharmaceutical industry, as it is a fundamental element that supports production and how all the processes take place. The respondent also takes into account the innovative capacity of firms (IC), previously discussed in the study. The capacity to innovate is essential because it "contributes directly to innovation by allowing for the identification and translation of external knowledge inflows into tangible benefits for the firm" (Shearmur et al. 2015). As such, being able to

respond to the market changes and use the information available to innovate is of crucial importance for the pharmaceutical industry. Given this, an initial link between innovation and the importance of external knowledge can be identified.

> *"For me, innovation is to invent/reinvent, either proactively or reactively, products, processes, structures, and ways of doing business. Innovation is of vital importance for the pharmaceutical industry. This industry depends on having a flow of products, a market for its products, and competitive costs of production and sales. These are changing factors that require the industry to have innovative capacity."*

(Respondent 5, Company E)

Furthermore, for AstraZeneca, innovation can have diverse meanings, but in essence it comprises *novelty* in the sense that it involves doing things differently, which has also been supported by the findings presented above. For the company, technology is an essential part of the innovations that take place within the organization, as in Company B. These technologies support the efficiency of their Puerto Rican site.

> *"...innovation can mean many things. AstraZeneca innovates by finding ways to do things differently, such as gaining in efficiency or implementing better technologies. Some of this is being done here in Puerto Rico at this site, implementing those technologies as part of manufacturing."*

(Ileana Quiñones, President and General Manager, *iPR – AstraZeneca*, Puerto Rico)

Respondent 4 provides an intriguing contribution to the concept of innovation, as the *novelty* intrinsically related to it is developed in order to create *value*. As established by Pisano (2015), companies have to select the types of innovation that will allow them to create and capture the most value. As such, creating value can be regarded as the essence and main aim of innovation. In this sense, companies implement innovations in order to increase the ways in which they create and deliver value, both within their companies and to their global clients. Another important finding regarding innovation concerns the importance of creating collaborative environments that allow for further and more encompassing developments in

research, thus leading to higher innovation levels. Hence, integration amongst diverse players is pivotal in order to achieve significant levels of innovation.

> *"To me, innovation is creating a new product, process, or service that benefits people and businesses and creates value. [...] Within our industry, I believe it is crucial for companies to not only create innovation through their own R&D groups, but to also collaborate with partners both within and outside the industry. An open research environment creates new possibilities for all of us. By breaking through barriers and working collaboratively with others, we can more quickly deliver the next generation of medicines to the patients who need them."*

(Respondent 4, Company D)

This collaborative approach is supported by Novartis, a company that seeks to make sure that their innovations are available to every eligible patients around the world. This presents a very interesting contribution about the importance of innovation within the pharmaceutical industry in Puerto Rico. The company values innovation to the extent that it aims to make sure that such innovations are made available to every eligible patient. Essential components in order to achieve this is communication and an integrative framework between the diverse sectors that have an effect on the industry, including political players. Thus, as also established by Respondent 3 (Company C), country – level innovation has an effect on industry – level innovation. This is also supported by Respondent 4 (Company D), who believes it is essential to collaborate with diverse sectors in order to develop further innovations. Working alone is not sufficient.

> *"... we ought to work with public and private players to ensure that access to innovation is not only reserved to those who can afford it. All eligible patients need to be able to access this innovation. This will require innovative thinking, more sophisticated approaches from all parties and an open dialogue in how we can work together to address the needs of these patients."*

(Fabrice Chouraqui, President of *Novartis* Latin America and Canada)

Moreover, Respondent 6 presents an engrossing contribution by stating that an important aspect of innovation is being able to make the innovative idea a reality. Thus, it is essential that an innovation is feasible. Further, the respondent places special attention on innovation within the pharmaceutical industry by expressing that it is the essence of the industry, its "*reason of being*." The advances that have been developed over time are what have propelled the industry's growth and importance. Additionally, a proactive approach to innovation is also presented.

> *"For me, innovation is finding a different solution to fulfill, satisfy or create a need, and make it viable. I think that a key element in order for an idea to stop being good and become a real innovation is that it translates into some result or that it can be implemented. ... At a macro level, of the industry, innovation is the reason of being, because this industry is based on [...] finding solutions to improve a health condition, [...] or to extend the life of a person, and in some cases to eradicate a health problem."*

(Respondent 6, Company F)

Additionally, for Haemonetics, innovation is directly related to the clients, who have diverse expectations about their products and services across the globe. While there may be common market expectations, companies within the industry succeed when they innovate by recognizing the existing differences and adapting to their markets, as previously discussed in literature (Kanter 1984: 20). As such, a client – focused innovative approach is presented, where being able to anticipate, understand and cater to the specific needs of clients is crucial.

> *"For us innovation is about anticipating, listening, understanding and striving to fulfilling and exceeding our customer expectations, recognizing that expectations can vary from one market to another."*

(Dante Castillo, Managing Director, *Haemonetics*, Puerto Rico)

From the discussion, it can be indrawn that innovation plays an essential role within the pharmaceutical industry, given its need to continuously develop and implement the best and most effective products, processes, and services for their clients and patients. While

respondents expressed their views of innovation in slightly different ways, an identified pattern is that innovation regards creating new things (novelty) and/or developing new ways of doing things (improvements), as supported by theory (Kanter 1984: 20; Oslo Manual 2005). Additional insights make interesting contributions regarding innovation within Puerto Rico's particular pharmaceutical industry, mainly: the important role of technology in the process of developing and executing innovations; the relevance of creating collaborative environments where diverse players contribute to the creation of innovations; the importance of adapting to markets and meeting needs and expectations. Furthermore, the perception of value as the main aim of innovation is notable, as well as the importance of developing innovative capabilities that allow companies within the industry to make innovations feasible.

### 8.1.2. Types of innovations

Regarding the types of innovations adopted within Puerto Rico's pharmaceutical industry, a combined approach was identified, as supported by Respondents 4 and 5.

*"[...] we drive innovation across many facets of our business."*
(Respondent 4, Company D)

*"In Puerto Rico, innovation has to do with a combination of types of innovation."*
(Respondent 5, Company E)

From the perceptions of the sample, it can be drawn that, within Puerto Rico's pharmaceutical industry, process, product, and organizational innovations are prevalent. These are commonly combined in order to support a comprehensive organizational approach to innovation. As established by Fillipetti et al. (2013), different innovation types are interconnected and complementary. Thus, their combination has a positive impact on performance.

Company A focuses on *process* and *organizational* innovation, while in Company C, *product* and *process* innovation play a major role, but *organizational* innovation is also adopted. On the other hand, Company F identified a closer approach to *process* innovation, although *product* and *organizational* innovation is also present.

> *"Process innovation, things we did in a certain way and now do in another because of the new tools we have to do them. [...] The organizational paradigm innovation, the organizational methods, of performance evaluation [...] redo it, change it."*

(Respondent 1, Company A)

> *"I think it is a combination. [...] Products and process innovations. The organizational methods are also something that we are constantly changing. We are always looking for the most effective ways to operate."*

(Respondent 3, Company C)

> *"It is mainly process innovation, although there could some related to products and also some related to organizational paradigm. In fact, in Puerto Rico, many companies have done many interesting things in terms of their organizational structures."*

(Respondent 7, Company F)

It was identified, however, that position (marketing) innovation is less common within the pharmaceutical industry. Notwithstanding, Respondent 3 recognized that it is also important in order to achieve the company's objectives. The respondent established that the operational flexibility of the plant supports the marketing groups, who develop innovations within their departments with the information they receive.

> *"In terms of marketing innovation, we do not talk much about it within the industry, but we do work very closely with our colleagues of what we call the "commercial side," in order to support their needs."*

(Respondent 3, Company C)

Respondent 2 presents an interesting contribution, establishing that in Company B, innovation is implemented to *services*, and not so much emphasis is placed on products or processes. As such, they seek to incorporate innovation in the ways they provide their services to their global customers. From the discussion, it was inferred that internationalization within the company is itself seen as a type of innovation, because for the company, to the extent that they offer their existing services to new people, they are innovating.

> *"For us, innovation is based on innovation in services. There are services that we have provided for a long time to the United States' market, which we are now starting to provide to Latin America, and even though it is nothing new for the North American market, it represents an innovation for the Latin American market."*

Given the findings, innovation takes diverse forms, as supported by literature (Francis and Bessant 2005; Bessant and Tidd 2007: 13), and a combination of innovations is often beneficial (Fillipetti et al. 2013). Regardless of these classifications, however, research suggests that innovation types are interdependent (Wischnevsky et al. 2011). For this reason, the process innovations carried out within the industry, affect product and organizational innovation, and so on. Process innovation was the most common type of innovation identified within the sample, which can due to the fact that the pharmaceutical industry is highly ... However, product and organizational innovation were also considered crucial, especially in recent years, when many pharmaceutical companies have had to undergone transformational organizational changes.

### 8.1.3. Innovation strategies

Given the data obtained from the sample regarding the innovation strategies adopted within the pharmaceutical industry in Puerto Rico, it could be identified that innovation is carried out through diverse strategies, which vary depending on the context to which they are applied. This is supported by literature, as different kinds of innovation can be complementary (Pisano 2015). Generally, though, innovation follows an incremental

approach within companies. However, in certain areas of the industry, radical and/or disruptive strategies are better suitable.

As stated by Respondent 5, within the industry, the innovation strategies adopted are varied. For example, when a product is first introduced to a market, a *radical* innovation takes place. However, the improvements that are made on such product follow an *incremental* innovation approach.

> *"Innovation in the pharmaceutical industry is not limited to one type. When a brand new product is introduced, innovation is radical. When improving an existing product, innovation is incremental."*

(Respondent 5, Company E)

Respondent 2 states that Company B has adopted an *incremental* approach to innovation. The company has grown as their resources and opportunities have allowed them to, implementing small, gradual innovations that have supported their development within the industry.

> *"It would be incremental. We were founded as a single – person company, and the company has grown from there [...] and the company has renewed itself as the market has presented opportunities. [...] Everything has happened in an incremental way, as the company has developed the structure and resources to do it and have growth."*

(Respondent 2, Company B)

In the same way, Respondent 6 states that *incremental* innovation is the most common strategy within Puerto Rico's manufacturing facilities. However, at a macro level, of the industry as a whole, innovation takes on a *disruptive* approach, as new innovations are being developed for conditions that do not have solutions.

> *"In manufacturing, the innovation that is done is mostly incremental. At a macro level, of the industry, it is definitely disruptive because finding a solution to a heath condition that does not have an available therapy is obviously disruptive. At a manufacturing*

*level, however, in Puerto Rico and in other parts of the world, it is mainly incremental."*

(Respondent 6, Company F)

Similarly, Respondent 1 established that in Company A, innovation is usually carried out *incrementally*. However, the innovation that relates to the clients has recently adopted a *disruptive* approach. This presents an interesting angle, because the company has had to differentiate between the innovations strategies that better adapt to the diverse parts of the firm. It was identified during the interview that due to high regulations, the pharmaceutical industry mainly follows an incremental innovation path. As such, a gradual approach to innovation is generally the most suitable. However, changing customer needs allow for, and often require, more intense innovation strategies, since business models are changing.

*"My clients are manufacturing companies that have been doing things in one way their whole lives. Now, they are outsourcing, and you begin to become part of their department. That kind of partnering is quite disruptive. That's why it takes so long to implement, and even more so because my clients are in a regulated industry. Pharmaceuticals are the last ones to do disruptive things."*

(Respondent 1, Company A)

Finally, Respondent 7 establishes that often times, innovations require a *radical* approach in order to obtain better results. However, the respondent states that within Puerto Rico's manufacturing sector, *incremental* innovation is the overall strategy of innovation.

*"I had many experiences where we had a process that we had tried to improve gradually, but there came a time where it was necessary to make substantial changes. [...] It is mainly incremental, but in the fundamental side, of the development of new products, it is disruptive or radical."*

(Respondent 7, Company F)

From the findings, thus, it could be argued that during the creation of the products (macro – industry level), a radical approach is adopted, since they are being developed for conditions that often do not have treatments. However, once those treatments and drugs have been

approved and are supplied to the markets (micro – level), they go through continuous improvements, thus following an incremental approach.

### 8.1.4. Summary

From the discussion, it becomes evident that innovation plays a critical role within Puerto Rico's pharmaceutical industry. The constant global challenges, as well as international competition, have made innovation fundamental. In addition, it can be inferred that, given the scientific nature of the industry, innovation is ingrained within it, as scientific developments are in constant advancements of new and innovative pharmaceutical treatments.

As can be derived from the previous discussion, innovation within the industry has two slopes: novelty and gradual improvements, as proposed by literature (Kanter 1984: 20; Baregheh et al. 2009). An interesting finding obtained from the data is that the degree of such novelty depends on the company's strategic objectives, and that novelty itself can be said to encompass the concept of *improvement*, because these incremental advances also rely on new ways of doing things. In addition, from the findings it can be drawn that novelty can regard deep – seated and unique creations, or also new ways in which the services are delivered or the geographical reach of such services. This presents an interesting connection between innovation and internationalization, because internationalization itself is sometimes considered an innovation depending on the company's aims.

Something that has been identified is that diverse innovation types are adopted within the industry. While process innovation seems to be the most common type of innovation adopted within the sample, companies combine it with product and organizational innovations as well. This supports literature, as it is common for companies to adopt a combined approach to innovation (Wischnevsky et al. 2011). Further, innovation also takes diverse forms within the industry. Innovation occurs mostly in an incremental way, particularly from a manufacturing perspective. However, a radical and/or disruptive strategy, especially in the

phase of product development, is also present. In this sense, while some areas of a business survive on gradual innovations, others depend on radical innovations, such as business model changes.

## 8.2. Internationalization within the pharmaceutical industry

Within the context of business, *internationalization* regards opening up to new foreign markets. As discussed, the continuous development of the current global economy has led to an increasingly interrelated business world, which has attributed much pertinence to the phenomenon of internationalization (Wattanasupachoke 2002; Rogers 2004). Thus, after exploring the concept of innovation from the perspectives of diverse leaders within Puerto Rico's pharmaceutical industry, it becomes important to also present what *internationalization* means to them. As such, this section discusses what internationalization represents to the studied sample, including the motives for engaging in internationalization within the pharmaceutical industry and the general internationalization approaches adopted.

### 8.2.1. Meaning of internationalization

As stated by Hitt et al. (1994), internationalization relates to "expanding across country borders into geographical locations that are new to the firms." While this is sustained by other scholars (Ruzzier et al. 2006), Respondent 2 adds a very interesting contribution to theory, stating that internationalization is not only entering different countries, but also assimilating the culture and different markets of the foreign countries. In essence, that a real immersion in such countries is important. Interestingly, Respondent 3 goes along the same line, establishing that internationalization goes beyond regular global expansion. It concerns making that global expansion as consistent as if the company was working within the same country. Throughout the interviews, both respondents pointed out the importance of acting globally, but thinking locally. In the same way, Respondent 4 also regard internationalization

as a process where it is important to take into consideration the country and culture. These present very interesting and thought – provoking findings, as internationalization involves more than just the establishment of operations overseas, but an exhaustive immersion of the company into the country and culture. It can be argued, thus, that internationalization within Puerto Rico's pharmaceutical industry considers specific market factors, going beyond the traditional theoretical descriptions discussed in the paper.

> *"[...] internationalization does not only relate to providing services in different countries, but accepting and adapting to cultures and markets in different countries. [...]We like to use the term "glocal." It is offering services in the most global way possible, but offering them with a local footprint. [...] In essence, internationalization means that a company becomes recognized as a company of the country or region in which it operates, although everyone recognizes that it has an experience and background that it has imported from other places."*

(Respondent 2, Company B)

> *"[...] internationalization is the capacity to being able to work at a global level with all the countries in the world as if they were local. [...] I could be embarking to 100 countries in the world, and that for me is global expansion, but internationalization for me goes a bit further: it is making such global expansion as if I was working with neighboring countries or within the same country."*

(Respondent 3, Company C)

> *"The term "internationalization" to me is taking a product or service to global markets and ensuring the successful use within that local country and culture."*

(Respondent 4, Company D)

Another interesting finding regards the adoption of internationalization in order to achieve strategic objectives. As discussed in theory, internationalization has recently become an important business strategy (Sdiri and Ayadi 2014). This is the case for Company A, because internationalization is a way for the company to achieve its strategic goal of creating closer relationships with their clients, no matter where they are located geographically.

> *"For me, it is the fundamental element of our business strategy [...] In essence, our strategic objective is to stay within the same pharmaceutical segment [...] so it is not regional. For me, it didn't matter where we were [...] because it is the way that I can serve a client with different plants around the world, and intimate more with them."*

(Respondent 1, Company A)

Moreover, from the standing point of the pharmaceutical cluster as a whole, Respondents 5 and 7 agree that multinationality is very important for the industry. In fact, Respondent 7 states that the industry is international by nature, with companies having substantial international participation, as supported by research (ABPI 2016). According to Respondent 5, such multinationality gives companies access to information, which is particularly relevant within the context of this study, as current theory focuses on internal and external sources of information and knowledge as one of the main ways in which internationalization drives innovation, as will be discussed further in the paper.

> *"The pharmaceutical industry in Puerto Rico is part of a multinational industry [...] Being multinational is very important for this industry. This gives you access to information and flexibility to locate and/or move legal entities and/or production from one country to another."*

(Respondent 5, Company E)

> *"We are talking about multinational corporations, so naturally they are already internationalized. The pharmaceutical industry is globally integrated. [...] From Puerto Rico, we send products to at least 100 countries. This is a completely international industry [...] global by design."*

(Respondent 7, Company F)

From the discussion, it can be drawn that internationalization is an integral part of the pharmaceutical industry. While it regards the expansion to new markets, internationalization within Puerto Rico's pharmaceutical industry takes a further meaning, identifying the need of adapting to the foreign markets. As such, internationalization covers a broader definition than the traditional global expansion view present in literature (Hitt et al. 1994; Ruzzier et

al. 2006). Additionally, internationalization is also often implemented as a strategic objective, because given the global nature of the industry, being present where clients are located is essential. Further, and particularly relevant, internationalization is perceived to give access to unique information and flexibility not available otherwise.

### 8.2.2. Internationalization motives and market selection

As established by Yip (1989), there are four main drivers that motivate internationalization, these being: *market*, *cost*, *government*, and *competitive drivers*. From the discussions, it was noted that within the industry, some companies' internationalization was/is mainly influenced by *market drivers*, namely global customers and contacts within the foreign markets. In the case of Company A, Respondent 1 stated that the company established operations abroad primarily motivated by the localization of their global clients, who facilitated their localization in the foreign markets. The decision to internationalize, being a strategic objective of the company, was done in order to achieve their competitive differentiator, which is to have close and long – term relationships with their clients, wherever they are located. In the same way, Respondent 2 established that Company B decided to internationalize due to constant requests from their global clients. As such, both companies expanded operations where they already had existing clients. In this sense, the selection of countries was based on market needs (i.e. needs of their clients). Additionally, in both cases, their global clients and established global networks within the markets presented significant advantages in terms of the facilitation and successful establishment of their foreign operations, as supported by literature (Madsen and Servais 1997). The internationalization of Company D presents a similar scenario, where the company has expanded operations in order to be able to provide their products to their customers around the globe. The locations of their international operations have been based on strategic locations that allows them to reach them more easily.

> *"My clients are multinationals [...] In order for us to achieve our differentiator, customer intimacy, we have to be able to serve our clients, wherever they are. We have positioned ourselves where they have their operations. [...] They were also the ones that facilitated the process. [...] We established in the countries mainly because of the customers."*

(Respondent 1, Company A)

> *"Some of our clients told us: 'If you are doing this for me here and I am satisfied with your work, why not do is in other places as well. If I have found the partner with whom I feel comfortable, I want to replicate this success in other places'."*

(Respondent 2, Company B)

> *"As a global, science – led company, [company] seeks to make our medicines available to patients globally. In order to ensure the products are available to specific regions and markets, it may require investing in a presence in a specific region, country, etc. This could help to facilitate many aspects of the business, such as product registration and approval, manufacturing, or marketing."*

(Respondent 4, Company D)

Furthermore, a combination of *competitive*, *cost*, and *government* drivers were also identified within the sample. Pharmaceutical companies expand in order to increase sales, but there are also other economic motivators that influence how internationalization takes place. For example, during the interviews, it was stated that companies that have greater international participation, lead the industry. Moreover, in the particular case of Puerto Rico as a global pharmaceutical attraction, public policy measures, such as generous tax and economic incentives, have been some of the main reasons for expansion to the country, according to the participants of the study. This is also the case with Ireland, for example, who offers significant economic incentives and tax benefits for foreign companies to establish operations, which is one of the reason Companies A and B expanded there. Additionally, an interesting finding that derived from the discussions was that Puerto Rico's extensive pharmaceutical industry experience, the high academic preparation of its habitants, and the overall quality of the human capital also act as main drivers for industrial players to

expand to the country. In essence, the knowledge and experience that has been developed within the jurisdiction.

> *"We seek to expand sales internationally because it obviously translates into more dollars, more income generation. [...] In terms of expanding to Puerto Rico [...] our jurisdiction is still the most attractive in the world to conduct operations of the pharmaceutical industry. This is due to the financial incentives that Puerto Rico offers."*

(Respondent 3, Company C)

> "*The treatment of income for federal tax purposes is one of the determining factors. Other important factors are [...] facilities, infrastructure, and human capital."*

(Respondent 5, Company E)

> *"The tax incentives program for R&D is really good and this is also available for services and manufacturing."*

(Dante Castillo, Haemonetics)

> "*I would say that it is definitely related to costs, competitiveness, to public policy [...] but in this industry there is also a very strong driver that is related to knowledge. The knowledge factor becomes key within the industry. [...] So, I would say costs and competitiveness, but I would add knowledge*."

(Respondent 6, Company F)

> *"One of the drivers is how to capture a more ample participation of the global market. Obviously, the companies that participate the most in international markets, will have more catch of that participation."*

(Respondent 7, Company F)

Given the findings, in terms of entry strategies, the *location* component seems to be the most relevant within Puerto Rico's pharmaceutical context. Virtually, cost and tax factors (tax rates and investment incentives), strategic factors (strength of the existing manufacturing activities, the industrial connections, the workforce productivity, and the inbound and

outbound logistics), and regulatory and economic factors (industrial policies and FDI policies), as established by literature (Luo 2002: 181- 190).

### 8.2.3. Internationalization process

As previously discussed in literature, innovation can be linked to internationalization through a stages models approach, where internationalization is seen as a cautious and progressive process (Murray and Ron 2010). From the perceptions of the studied sample, internationalization within Puerto Rico's pharmaceutical industry follows an incremental approach.

Companies 1 and 2 stated following a gradual approach to innovation, driven by the market insights gained throughout the process. Interestingly, Company 3 also experienced a gradual process during the initial stages of operations.

> *"Our internationalization process was very gradual. [...] It takes a lot of time, because at the same time, you also have to make sure that you provide the same level of service to clients. There has to be a lot of consistency. [...] It takes a lot of time being able to escalate in a sustainable way, while controlling the experience of the brand."*

(Respondent 1, Company A)

> *"I would say that from a certain point, it has been gradual. [...]of course it depends on what one compares it to, but our internationalization process began in 2006. [...] Back then the company was thirteen years old [...] it has taken us ten years and we are still working on it."*

(Respondent 2, Company B)

> *"During the first twenty or twenty – five years, the internationalization was gradual. ... That changed, and in the last ten years, the internationalization has been much faster. ... From Puerto Rico, we now export to one hundred countries, compared to twenty – five, ten years ago.."*

(Respondent 3, Company C)

From the empirical data, it can be argued that a gradual approach to internationalization within the pharmaceutical industry is related to the stage in which the company finds itself. In other words, a gradual approach to internationalization is often adopted in the initial phases of companies. For example, within Companies 1 and 2, an incremental approach to internationalization has been adopted, resulting from the opportunities that have risen from their incremental foreign operations and the learnings that have resulted from them. This can be justified given that they are relatively young companies. In the same way, Company 3 experienced a gradual internationalization growth within the first twenty – five years of operations. Within their Puerto Rican division, their expansion has only recently experienced a faster pace of global growth, increasing from twenty – five countries of reach, to over one hundred in the last ten years. An interesting contribution to the stages models is that a gradual approach to internationalization may allow for more consistency in the level of service provided across the globe, as can be inferred from Respondent 1's answer. It can be argued, thus, that a gradual approach provides space for gradual learning, hence allowing for a deeper understanding of each market.

From the findings, it can be argued that the U – Model of internationalization has been applied, where internationalization develops as changes and advances occur within companies and their environments (i.e. new challenges and opportunities) (Johanson and Wiedersheim – Paul 1975). In essence, the companies have internationalized following logical steps based on a gradual gain of information, acquired from their foreign markets and operations. Additionally, as stated by Carneiro et al. (2008), the U – Model establishes that firms first internationalize to psychically close countries and gradually move to more distant markets. This is certainly the case of Companies 1 and 2, for example. The former first expanded to the United States, developing connections and opening offices in several states, later expanding to Europe. The latter also followed this behavior, as the company initially opened offices in the United States, and further expanded to Europe and South America. Furthermore, another interesting approach to the stages models of internationalization is proposed by the I – Models, previously discussed. The I – Models that most relate to the

studied sample are Cavusgil's (1980) and Reid's (1981), in which firms are interested in international participation form early stages. For example, Company 1 indicated that internationalization was a strategic objective of the company, for which the firm always aimed at expansion. Given the global nature of the industry, it can be argued that a vast majority of companies present interest in international growth from early stages, as was the case of the sample.

Moreover, according to the findings, networks play a very important role when it comes to the first step towards internationalization to a new market, following the network theory previously discussed. This is supported by literature, as the updated version of the U – Model (Johanson and Vahlne 2009) argues the importance of the *network theory*, which called for changes in the original U – Model. Now, it is believed that business relationships have a significant impact on the markets firms decide to enter. As established by Madsen and Servais (1997), it is through relationships that firms gain access to external resources that allow them to establish themselves successfully in foreign markets. As was discussed in the previous sub section, client networks and contacts within the markets of interest facilitated and had a considerable influence on the internationalization of Companies 1 and 2. From those initial relationships, other relationships formed, which, at the same time, grew into further opportunities. As argued in the theoretical part of the research, building networks and relationships with customers is extremely important in global business settings, because these mutual relationships allow for better results in the internationalization process, reducing liability of foreignness.

### 8.3.4. Summary

From the data, it was found that internationalization within Puerto Rico's pharmaceutical industry gains a broader meaning than that discusses commonly in theory. Expanding across national borders is considered *global expansion*, while internationalization adds to such global expansion by considering specific characteristics of the global markets, in order to be able to adapt to them. It was also found that the pharmaceutical industry as a whole is

extremely integrated and global, for which internationalization is a natural and essential part of it. As stated by Respondent 7, it is "*global by design*." Given this multinational industrial phenomenon, companies have larger access to broader sources of information, which can support their operations. In addition, it was found that *market drivers*, mainly global clients, are the main motivators for expanding operations abroad, as within a number of the sample, internationalization was motivated by the localization of other pharmaceutical clients. These clients and networks facilitated their internationalization process, as proposed by literature. Moreover, a combination of other *competitive*, *cost*, and *government* drivers were also considered to motivate internationalization. Puerto Rico, for example, presents many tax benefits for global pharmaceuticals companies, explaining their strong presence in the country. However, it was also found that aside from these traditional motivators established by literature, the *knowledge* and *industry experience* of Puerto Rico were also highly valued as motivators for establishment in the country. Amongst the sample, a stages approach to internationalization was identified, with gradual and incremental steps leading the way to global expansion. As such, the U – Model and I – Models were identified. However, from the findings, it was argued that an incremental approach to internationalization can be related to the phase in which the company finds itself. Mainly, it was found that in the initial steps towards internationalization, a gradual approach is adopted, but after a solid establishment, a more rapid process takes place.

## 8.3. Internationalization as a driver of innovation

After answering RQ 1 (*What do innovation and internationalization mean within Puerto Rico's pharmaceutical industry?*), the following section answers RQ 2 of this study: *How is internationalization perceived to drive innovation within Puerto Rico's pharmaceutical industry?* In order to do so, the respondents' views on this relationship are presented and discussed.

### 8.3.1. Relationship

At a macro – industry level, Respondent 2 presents an interesting perspective. In Company B, internationalization drives innovation by allowing for further flexibility in the processes the company develops in order to reach and adapt to their international markets. In other words, internationalization has driven its innovative approach when developing methods that allow it to provide the same consistent level of services, in a different way to their global clients. This has developed an innovative expertise within the company, which, according to the respondent, can only be achieved through internationalization.

> *"I believe internationalization increases innovation. [...] Independently if the service you provide is good [...] in order to provide that service in another country, you need to adapt to the country. [...] In the end, it is the same services experience we provide in Puerto Rico, but provided to the client in a different way. We have had to develop methods, an internal method of how to do them and how to develop those projects [...] While maintaining a consistency in the experience the client seeks, we have had to learn to deliver the services in a different way. [...] And that occurs because we have internationalized."*

(Respondent 2, Company B)

Similarly, Respondent 3 established that internationalization has driven the innovation of the company's whole supply chain, given their need to expand globally. As such, they have tailored their supply chain in order to better reach and adapt to their markets, and ensure higher degrees of efficiency and global extent. In this sense, internationalization has driven innovation within the company by acquiring an innovative approach to how their whole operational chain is managed.

> *"[...] internationalization has been the driver of innovation from the point of view of the supply chain. [...] All of its customization has been motivated by the need of expanding internationally."*

(Respondent 3, Company C)

In both cases, the perceptions of how internationalization drives innovation are directly related to adapting to markets. As such, it can be inferred that internationalization allows for greater foreign contact, leading to customized innovative approaches to global markets.

Respondent 7 provides support from a different angle, establishing that internationalization drives innovation because it forces companies to meet diverse market needs. In this sense, internationalization forces companies to innovate because diverse markets presents distinct needs and require different approaches. Thus, in order to survive competition in international, innovation is pivotal.

> *"Internationalization forces to satisfy different markets, different needs, and there has to be innovation."*

(Respondent 7, Company F)

Moreover, an important finding that derived from the data is that of knowledge as an essential element within Puerto Rico's pharmaceutical industry. For example, in the process of product production, there has been a shift towards obtaining knowledge, as stated in one of the transcribed interviews of this study. It is through such knowledge that products undergo further improvements throughout their life cycles.

> *"What has changed is the idea of placing knowledge at the front end, building the knowledge as the product matures."*

(Andrew Wirths, Merck, Puerto Rico)

This finding becomes particularly relevant within this paper's theoretical discussion, as knowledge has often been regarded as key in the relationship between internationalization and innovation (Hitt et al. 1997). Interestingly, it has been identified that, related to knowledge, internationalization drives innovation within the industry in two particular ways: it provides higher visibility at a macro – industry level, leading to the implementation of competitive innovative practices; and it facilitates how knowledge, both developed internally and obtained externally, is shared across the company through its international

divisions, also leading to higher degrees of innovation. An important aspect of this discussion is knowledge – sharing, as will be further presented.

As discussed in literature, when a company engages in international operations, it has access to unique sources of information that can develop into competitive knowledge for the firm, which can be used to increase innovation within the company through its diverse international divisions, as summarized in **Figure 5**. As previously discussed, from their learnings of their environments, international divisions increase the innovation scope within the company as a whole. As such, through high degrees of interactions with their diverse geographical contexts, firms are able to further develop their innovative performances. As supported by several other scholars, the unique knowledge developed, as well as the ability to create and transfer it across foreign divisions, is considered a strategic asset (Nonaka and Takeuchi 1995; Bierly and Chakrabarti 1996; Spender 1996; Teece 1998). This is the case in Puerto Rico's pharmaceutical industry. At a macro – industry level, internationalization is perceived to drive innovation by allowing for higher visibility regarding industry standards across global jurisdictions, thus enhancing the competitive advantages of companies. Respondent 1 suggests that internationalization drives innovation by allowing companies to see what is being done across the industry in diverse pharmaceutical clusters, like Ireland or the United States, for example. By doing so, they are able to learn about the innovative practices that are being conducted abroad, and implement the innovations that best serve them. As the respondent states, it leads to benchmarking, which allows them to compare themselves to industrial standards. The respondent also adds that internationalization allows companies to receive feedback about their practices by sharing them across their international divisions, thus providing space for improvement. Additionally, the company has found that, often times, international clients have motivated their innovation by sharing their own innovative practices, which the company has later implemented to its global offices. As can be drawn, knowledge sharing has been key.

> *"Internationalization increases the experience of your processes and their feedback loop, so you can improve them. At the same time, it increases your reach of seeing*

> *what is happening in the world, in the industry. I can see something in Ireland which is good, and then I implement it in Puerto Rico, or I can be doing something in the United States and they ask me: "but why are you not doing it this way?," and then I start doing it another way and implement it to the other offices. For my clients it is also fascinating, because when they implement an innovation [...] they already know that we can implement it in their other locations [...] Internationalization is fundamental in order to be connected to the world and know what is happening and the best practices. That is, the benchmark."*

(Respondent 1, Company A)

Respondent 3 provides support to this by stating that internationalization allows companies to see what other players within the industry in other jurisdictions are doing. This provides space for them to adopt greater innovative practices that enhance their competitive capabilities.

> *To the extent that you go to other jurisdictions and are capable of identifying what they are good or better at, and you copy it, or you use it to influence your own innovation."*

(Respondent 3, Company C)

Along the same line, Respondent 4 makes another important contribution, stating that knowledge sharing across global regions allows the company to gain information *prior* to entering a market. In this sense, global knowledge sharing influences the ways in which the company can innovate in order to reach those markets.

> *"Within a large, global company, it is important to understand the markets, and influences within those markets, before creating a presence and doing business. By utilizing external and internal knowledge and experience, you can ensure better decision – making and business planning. With continuous knowledge sharing among global regions, along with a culture of innovation, you can inspire increased innovation."*

(Respondent 4, Company D)

Furthermore, internationalization is also perceived to drive innovation by facilitating how knowledge is developed and dispersed *within* companies through their global operations. As stated by Respondent 5, internationalization drives innovation within the pharmaceutical industry by simplifying how knowledge and resources circulate across the industry. At a company level, the knowledge that is developed in one facility, can be shared with another. In this knowledge – sharing process, the international divisions of a company benefit from the innovations developed in other global branches. In this way, the innovations that best support the company can be implemented across the global operations. According to Respondent 5, given that pharmaceutical companies often have centralized structures, the parent company gathers the information and then disperses the knowledge within its international divisions. As supported by theory, both sources of information play vital roles in the knowledge transmission of the firm, having a direct effect on its innovation. As previously discussed, while internal networks propel the transfer the knowledge across the company and its international divisions, external networks assists the progress of the links formed between the company and its foreign environments (Gupta and Govindarajan 2000; Frenz et al. 2005; Amara and Landry 2005). Another interesting contribution made by the respondent is that this knowledge flow can also occur at an employee level, where managers are located in diverse international facilities where they able to learn from other ways of doing things, while also implementing the innovative practices that are carried out in his/her home division. This regards *experiential knowledge*, discussed in the U – Model (Johanson and Vahlne 1977). As established, experiential knowledge provides managers and employees with a broader background to perceive and formulate real opportunities, which plays a key role in the internationalization of firms, because such knowledge can be transferred and, thus, drive innovation across the whole company.

> *"Internationalization facilitates the flow of knowledge and resources. This occurs, for example, with the central structure of the matrix, which collects internal information (from its subsidiaries in different countries) and external (from other companies and countries) and then spreads it across its subsidiaries in several countries [...] It also occurs at the individual level, with the movement of management from one country to*

*another. In this industry, it is common for a manager to have job assignments of one, two, three years in facilities in the United States, South America, Europe, and Asia."*
(Respondent 5, Company E)

Respondents 6 and 7 provide support, establishing that, in essence, internationalization drives innovation through the learning and sharing of knowledge carried out across the international divisions of pharmaceutical companies. Both respondents emphasize that within this particular industry, since many products are made in different locations, the diverse facilities are able to learn from each other. For example, Respondent 6 states that from a manufacturing perspective, there are often *global teams* within a company's international network, whose main objective are to constantly share the innovations that are being developed. In this sense, the innovations that are developed in one country and/or operational division, are shared with the rest of the network. Respondent 7 supports this by asserting that within the pharmaceutical industry, the fact that the same products are made in diverse parts of the world leads to innovation because divisions are constantly communicating and sharing the advancements within their products and processes.

*"Internationalization definitely has an effect on innovation, because, from a basic manufacturing perspective, for example, you have global networks of manufacturing, and there could be a product that is manufactured in different locations around the world, and through the participation of global teams, the rest of the network can gain knowledge over how it is innovating another part of the operation and apply that innovation within its own facility. [...] If Puerto Rico innovates to improve a part of the process, other countries benefit from that innovation. The same happens when other countries innovate. I think that is one of the ways in which being multinational helps to innovate and multiply the benefit of the innovation."*
(Respondent 6, Company F)

*"A phenomenon that happens within this particular industry is the fact that many products are produced in so many different countries, which can help innovation [...] In one of the companies in which I worked, we had three facilities in three different countries in which we made the same product. [...] all the facilities were given the opportunity of developing innovations, but they were asked to share the knowledge*

> *acquired. Many processes were significantly improved due to the interaction within those three district facilities, working on and sharing their innovations."*

(Respondent 7, Company F)

Along the same line, Respondent 4 also provides support to the role of knowledge as a particularly important element in the studied internationalization – innovation relationship. In the case of Company D, the respondent establishes that internationalization drives innovation through their global research and development. The international reach of their research cluster has led to advancements in their discoveries and developments of innovative treatments that are improving patients' lives around the world. In this sense, innovation takes a deeper scientific approach, and internationalization enhances the developments that arise from the research conducted in the company's diverse international divisions. As such, the knowledge developed across its international clusters has greatly influenced the innovations that the company has developed over time.

> *"As a global, biopharmaceutical company [...] we have Clinical Research and Development happening simultaneously around the world. This has allowed advancements in our science, disease knowledge, and experience with new therapies to increase, while also allowing for the development of innovative treatments that are saving lives and improving the quality of life for global patients."*

(Respondent 4, Company D)

Given the findings, the framework presented in **Figure 5**. was revised in order to illustrate how knowledge is developed and transferred within this study's particular context. Within Puerto Rico's pharmaceutical industry, internationalization facilitates how foreign subsidiaries share and develop further knowledge amongst themselves. They do not work independently from each other, but instead constantly communicate and share knowledge through active internal global networks and teams. Through these networks, they share existing innovative practices and develop new ones, and also create further knowledge resulting from their collaborations, which translate into innovations that are transferred to

the parent companies. The parent companies gather the innovations and implement them throughout all their foreign divisions, and the cycle continues.

In essence, the framework supports the one developed from the theoretical findings, but much more emphasis is placed at the subsidiary level in terms of how innovative knowledge is created and shared. Previous theory focus on the external environments from which subsidiaries learn and gain knowledge, but within the studied sample, the focus is primarily placed on the internal networks. These are crucial for innovation, because from increased global collaborations, further innovations within the industry are created. Another important element in how knowledge is transferred within the industry is through the rotation of employees across their international divisions, as supported by literature. The revised framework is presented in **Figure 6**.

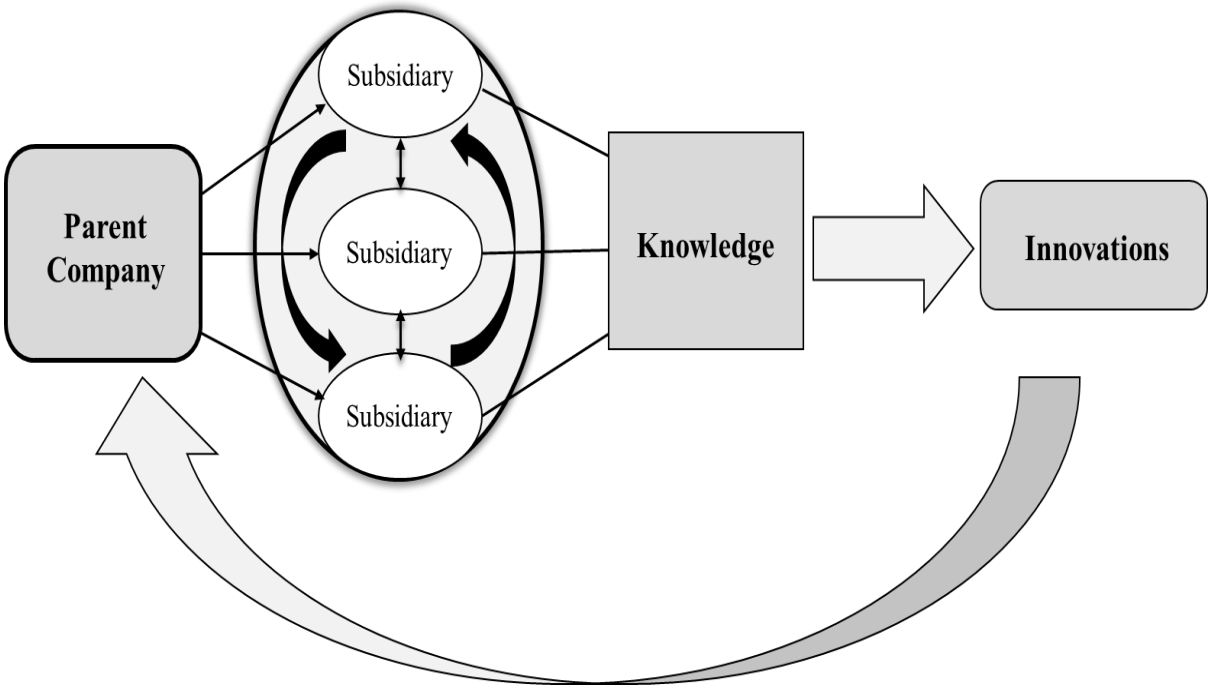


**Figure 6.** Knowledge in the process of internationalization as a driver of innovation within Puerto Rico's pharmaceutical industry.

### 8.3.2. Summary

Within Puerto Rico's pharmaceutical industry, internationalization is perceived to drive innovation in various ways. It can be inferred from the findings and discussion that, in a central way, internationalization drives innovation by forcing companies to adapt to diverse markets. In other words, global markets require different approaches, for which companies are in need of developing innovations in order to survive. As such, it can be argued that innovation is inherent to internationalization within the pharmaceutical industry, because in such a science – led industry, companies are in need of constantly searching for the best and most effective practices that allow them to expand their geographical reach. Furthermore, knowledge is believed to play an essential role in the relationship between internationalization and innovation. As was found, at a macro – industry level, internationalization allows companies to have further industrial visibility, through which they are able to gain unique and exclusive insights about better industry practices, which leads to higher innovation. In this sense, it allows companies to compare themselves to other players and adopt innovative practices that enhance their competitive advantages. On the other hand, and particularly relevant, at an internal – company level, internationalization propels knowledge sharing across subsidiaries, leading to further innovative advancements. Within Puerto Rico's pharmaceutical industry, such knowledge – sharing takes place through global networks and teams, and the international rotation of employees.

# 9. CONCLUSIONS

Based on the theoretical and empirical discussions of the research, this chapter presents the conclusions of the study. The theoretical contributions and managerial implications are presented, along with the limitations of the study and suggestions for further research.

## 9.1. Theoretical contributions

This study makes a contribution to current literature within the field of international business by broadening the existing understanding of how internationalization drives innovation, shedding new light on the relationship by studying how this process takes place within the context of Puerto Rico's pharmaceutical industry. The concepts of innovation and internationalization have been thoroughly explored, leading to an explanation of how the latter drives the former. From the empirical findings and analysis, internationalization is perceived as a driver of innovation. Interestingly, many of the findings were supported by previous literature. However, there are also several interesting contributions. From the study, it was found that innovation and internationalization are at the core of Puerto Rico's pharmaceutical industry. As a science – led industry, innovation is intrinsic to the sector, leading to significant advances in the treatments and medications that have saved the lives of millions of patients worldwide. As such, innovation is deeply ingrained within pharmaceutical operations across companies. In the same way, the pharmaceutical industry is global by nature, with companies increasingly expanding to diverse markets.

The study's empirical data present several interesting findings regarding how internationalization drives innovation within the studied industry. Theory has proposed that innovation in general takes two forms in terms of nature and degree: incremental and radical (Dewar and Dutton 1986; Orlikowski 1991; Bessant and Tidd 2007: 14). An interesting finding is that within the context of the study, an incremental approach to innovation was

prevalent, even though the pharmaceutical industry is commonly known for developing world – changing medical treatments. While these innovations make up an essential part of the industry's innovative behavior, in Puerto Rico, incremental innovations are more common. This could be due to high regulations across the industry and to the fact that most pharmaceutical players in the country are subsidiaries of foreign MNCs. In the case of local MNCs within the industry, the approach to innovation is similar, with an incremental innovative behavior prevailing. As such, within Puerto Rico's pharmaceutical industry, innovation generally takes place through gradual improvements, which are achieved through high degrees of knowledge – sharing, feedback, and industrial benchmarking. Given this gradual approach to innovation, it has been inferred that internationalization drives innovation within Puerto Rico's pharmaceutical in an incremental way as well. In this sense, the information gained through their global participation leads mainly to gradual improvements in the products and services, naturally leading to incremental innovations.

Furthermore, the study make a contribution to current literature by broadening the meaning of *internationalization*. While existent literature refers to the concept as a process through which companies expand across national borders, within Puerto Rico's pharmaceutical industry, the term gains a broader meaning. Given the diversity of health needs across the globe, companies have had to develop extensive international capabilities that allow them to meet such needs in specific geographical contexts. In this sense, it was found that internationalization goes beyond the phenomenon of *global expansion*, because an integral part of this expansion is being able to assess the characteristics of each market. Particularly, internationalization within the studied context regards reaching foreign markets, but with a local approach and while maintaining a global consistency in services. This, in itself, can be inferred to lead to the development of innovative capabilities that allow companies to successfully enter and excel in such markets. As can be drawn, internationalization covers a wider theoretical spectrum, gaining an added value through innovation. Related to this, it has been found that internationalization drives innovation within Puerto Rico's pharmaceutical industry by driving competition. In other words, internationalization obligates companies to develop and adopt innovations that allow them to enter and succeed

within their markets. In this way, it can be said that innovation naturally results from internationalization because, due to global expansion, companies are in need of developing innovations that allow them to remain competitive. As such, international expansion within the industry allows companies to continue developing their innovations.

Finally, as a science – led industry, it was found that knowledge plays a pivotal role in how internationalization drives innovation within Puerto Rico's pharmaceutical industry, supporting the KBV discussed in literature. At an internal – company level, one of the main findings of this study regards the importance of internal networks, not only because they ease knowledge transfer, but because through active collaborations within international subsidiaries, higher degrees of innovation can be achieved. While previous research focuses on the learnings subsidiaries gain from their external environments and later transfer to the parent companies, the findings of this study suggest that significant weight is placed on subsidiary team – work, in the aim towards innovation. These collaborations are driven by global networks and teams, which actively work together to communicate the best practices and develop further and advanced innovations. As such, in the process of achieving innovation through internationalization within the pharmaceutical industry, significant importance is placed at an internal – company level, where the knowledge developed and shared amongst subsidiaries is crucial. From this analysis, it can be further inferred that such active, internal knowledge transfers between subsidiaries undermine the possible limitations presented by the KBV. As previously discussed, Shearmur et al. (2015) establish that even though companies can open themselves to foreign markets, they may not always be able to appropriate all the information and knowledge to which they have access. However, it can be argued that the diverse, strong global networks present within the pharmaceutical industry strengthen the capacities of companies to absorb, assimilate, and transfer information, and further develop innovations. In other words, through constant global collaborations, it can be argued that companies highly strengthen their innovative capabilities.

## 9.2. Managerial implications

The findings discussed in this research present several important managerial implications that can represent significant contributions to current international business practice. First and foremost, while it has been suggested that global participation facilitates how information is reached, this study has found that, by actively working together through global networks and teams, subsidiaries can become even higher sources of competitive advantages for firms. As such, MNCs should consider the added value that is created when their subsidiaries create networks that constantly work together in the development of new and innovative practices. By developing such global teams, companies will have better opportunities of increasing both the innovations that make them more efficient internally, and the innovations that are developed for their markets. Hence, this evidences the importance of developing solid internal knowledge – sharing platforms within MNCs, which further develop the capabilities necessary to absorb and transform external information into unique knowledge that is translated into innovations.

In addition, this empirical study suggests that internationalization requires more than just geographical expansion. As such, it is important for MNCs to consider other cultural and market – specific factors that might affect their establishment, especially within the pharmaceutical industry, where innovations are always emerging, leading to higher competition. Moreover, it has been shown that in the process of internationalization, clients and networks are key, particularly within highly regulated industries. Most times, as drawn from the findings, companies start internationalizing because of client requests. As such, it remains pivotal for MNCs to continuously develop and nourish their networks and relationships, as they often facilitate how companies enter and succeed in foreign markets.

## 9.3. Limitations

As has been addressed previously in the study, limitations may be present in research. In the case of this paper, several limitations have been identified, which should be taken into consideration upon further analyzing the study's findings and contributions to current research. In terms of the sample, the size of such cannot and is not aimed at being representative of the whole pharmaceutical industry. It simply offers a context – specific analysis that provides diverse perceptions from several leaders within Puerto Rico's pharmaceutical cluster. Related to such generalizability, a qualitative approach to research, particularly in terms of external validity, is limited. Due to mainly focusing on a particular geographical context where participants share similar characteristics, it is often difficult to generalize to a larger population. (Myers 2013: 9.) This has been particularly true for case studies, which have been previously criticized due to their limitations when trying to generalize findings. Often times, researchers try to select large cases with the aim of providing a "representative" sample of the context under study. However, no set of cases, regardless of their size, is likely to be completely representative of the population. Instead, the focus should be on generalizing findings to theory (Yin 1994: 37). For this reason, the findings of this study should not be applied to any context outside the studied sample, including other global clusters of the pharmaceutical industry, other industries, or other company types. The study's aim is not to generalize, but instead to provide a rich and contextualized depiction of how internationalization is perceived to drive innovation within Puerto Rico's pharmaceutical industry. As such, the study cannot provide interpretations beyond the sampled population. To address other particular contexts, further research should be conducted. Additionally, the purposive and snowball sampling techniques give space to bias, as the participants present similar characteristics. However, they were the sampling techniques that allowed for the identification and selection of the most knowledgeable participants for the study.

In terms of the interviewing process, a possible limitation is that, due to geographical constraints, the interviews were conducted via telephone, which could be argued to take away the value of face – to – face contact. In addition, the interviews were conducted in Spanish, and were later translated into English. The researcher has full bilingual proficiency. However, in research it might be possible for some loss in meanings through translation.

## 9.4. Suggestions for future research

In order to address the aforementioned limitations and enhance existing knowledge concerning how internationalization drives innovation, further research should be conducted within multiple industrial contexts. Exploring how internationalization influences innovation within other industries would provide more ample insight, resulting in further support and/or additional findings of how the process takes place. By conducting multi – industrial studies, further inferences could be made regarding patterns or differences amongst industries, leading to more exhaustive knowledge. Furthermore, to enhance the investigation within the pharmaceutical industry, an additional suggestion for further research regards conducting the study within a wider sample, including managers and employees who have had extensive international assignments, as well as suppliers and locals from the foreign markets. This would allow research to gain other varied perspectives of how internationalization is perceived to drive innovation within other contexts. Studying the phenomena within a larger sample would present better possibilities of being representative of how internationalization drives innovation. In addition, given how the pharmaceutical industry is highly internationalized, it would also be beneficial to conduct the study within the diverse pharmaceutical clusters around the world. Moreover, it would be useful for current research to approach the investigation quantitatively, in order to provide a numerical and economic analysis of how internationalization influences the innovative performance of firms. Mainly, to investigate the economic effects of such relationship and provide quantitative support.

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**APPENDIX 1.** Company profiles.

| COMPANY | COUNTRY OF ORIGIN | YEAR FOUNDED | INTERNATIONAL PRESENCE | COMPANY PROFILE |
|---|---|---|---|---|
| Company A | Puerto Rico | 1997 | North America, Europe | Provides control systems, instrumentation, and regulatory compliance services to the biotechnology and pharmaceutical sectors, and has incorporated innovation as one of its most important corporate values. Since its foundation, the company has achieved significant global presence, initially expanding to the United States, and subsequently to the United Kingdom and Ireland. In such countries, they respond to the needs of their biopharmaceutical multinational clients in their demands for the consistent implementation of their automation and regulatory compliance solutions. |
| Company B | Puerto Rico | 1993 | North America, South America & Europe | Services the pharmaceutical industry, growing to be one of the largest regulatory compliance and validation companies in the world. The company has experienced exponential international growth in a relatively short period of time, initiating its global presence with a project in Italy and later in the United States. Subsequently, it became a registered company in the United States, later expanding its operations to Ireland, and afterwards to Spain and Brazil. The company is well – established in both eastern and western Unites States and Europe, with diverse offices within such regions, and services a wider range of countries from their Caribbean, North American, South America, and European offices. |
| Company C | United States | 1980 | 100 + countries | It is one of the world's leading and largest biotechnology companies, with presence in more than 100 countries and a reach of millions of people in the fight against serious illnesses. |

| | | | | |
|---|---|---|---|---|
| | | | | The company is centered on a culture that embraces science and innovation, which has led to the successful launch of some of the industry's pioneering therapeutics, changing the course of the pharmaceutical industry and, subsequently, medicine. Their main objective is to discover, develop, manufacture, and deliver innovative medicines that help patients with serious illnesses. |
| Company D | Britain - Sweden | 1999 | 100 + countries | Global, science – led biopharmaceutical company whose innovative medicines are used by millions of patients worldwide. The company combines a unique range of knowledge, skills and experience to lead innovation in science. Their research sites focus on collaborations, innovations, and dynamic environments that allow them to keep developing further advancements. |
| Company E | Puerto Rico | 1933 | Services MNCs in Puerto Rico | Legal firm servicing the pharmaceutical industry in Puerto Rico, forefront of the needs of their clients growing and adapting as they require. |
| Company F | Puerto Rico | 2011 | Services MNCs in Puerto Rico | Consulting and advisory services to the pharmaceutical industry in Puerto Rico. Consultants have extensive backgrounds working as managers and executives at diverse MNCs in Puerto Rico and abroad. |

**APPENDIX 2.**

## INTERVIEW QUESTIONS TO MANAGERS

**Questions:**

1. How would you define *innovation*? How important is it for [company] and the pharmaceutical industry?

2. [The company's] innovation relates more to which of the following types? Please explain.

    a. Product innovation
    b. Process innovation
    c. Paradigm innovation (organizational methods)
    d. Position innovation (marketing)
    e. Combination
    f. Other

3. Has [company] adopted a "*radical"*, "*incremental"* or "*disruptive"* innovation strategy?

4. How would you define *internationalization*? How important is it for [company] and the pharmaceutical industry?

5. The academic literature establishes that there are certain "drivers" that impulse internationalization. These can be related to *costs*, *markets*, *public policies* and/or *competitiveness*. In [the company's] internationalization, which do you think were the principal motives for which it decided to expand operations?

6. What factors determined the selection of the countries to which [the company] has expanded?

7. Was [the company's] internationalization *gradual* (incremental) or *fast* (progressive)?

8. Do you think internationalization drives innovation? If so, how?

9. Much of the existing literature establishes that a way in which internationalization drives innovation is by providing and/or facilitating *external knowledge* (from the diverse markets) which can be applied within the company to increase its innovation. Based on your experience, is this true?

10. How does information flow within the international divisions of [the company]? Do you think that the organizational structure (centralized or decentralized) of the company influences how this knowledge is used?

11. How does [the company's] Puerto Rican division benefit from the knowledge the company obtains from its diverse international markets?

12. What do you think are the biggest challenges when managing international operations? How has [company] been able to overcome them?

Thank you very much for your time and contribution!

**APPENDIX 3.**

## INTERVIEW QUESTIONS TO CONSULTANTS

**Questions:**

1. How would you define *innovation*? How important is it the pharmaceutical industry?

2. In Puerto Rico, innovation relates more to which of the following types? Please explain.

    a. Product innovation
    b. Process innovation
    c. Paradigm innovation (organizational methods)
    d. Position innovation (marketing)
    e. Combination
    f. Other

3. Based on your experience, do you think companies within Puerto Rico's pharmaceutical industry adopt/have adopted a "*radical"*, "*incremental"* or "*disruptive"* innovation strategy?

4. How would you define *internationalization*? How important is it for the pharmaceutical industry?

5. The academic literature establishes that there are certain "drivers" that impulse internationalization. These can be related to *costs, markets, public policies* and/or *competitiveness*. Within industry's internationalization, which do you think were the principal motives for which it decided to expand operations?

6. What factors are determinant upon the selection of the countries to which companies expand?

7. How are companies able to obtain initial information about the markets to which they want to expand? Do they have networks in such markets?

8. Do you think internationalization drives innovation? If so, how has this process taken place within Puerto Rico's pharmaceutical industry?

9. Much of the existing literature establishes that a way in which internationalization drives innovation is by providing and/or facilitating *external knowledge* (from the diverse markets) which can be applied within the company to increase its innovation. Based on your experience, is this true?

10. Do you think that the organizational structures (centralized or decentralized) of companies have an effect on how this knowledge is taken advantage of?

    a. ¿How does Puerto Rico benefit from the knowledge its companies obtain in other international markets?

11. What do you think are the biggest challenges when managing international operations?

12. What efforts are being carried out in the country in order to continue internationalizing Puerto Rico's pharmaceutical industry?

Thank you very much for your time and contribution!